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LEWIS, R. W. B. (1947), *The Jaws and Teeth*, 2nd ed., 471. London: Science Publishing Co.

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THE DENTAL PRACTITIONER

Incorporating the "Dental Record"

Vol. V, No. 10

June, 1955



EDITORIAL

CARIES AND DIET

THE report on the effect of sugar supplements on dental caries by the Medical Research Council does not really upset the present theories on the aetiology of this disease. The conclusion they reach that under certain circumstances additional sugar does not lead to an increase in the caries rate is in keeping with modern thought. Dental caries may be equated as the rate of acid formation against the rate of neutralization of the acid by the saliva. It is the amount of unneutralized acid left that is important, which is not necessarily related to the amount of sugar or even the initial amount of acid. A small amount of sugar will cause acid formation and may lead to caries if it is not neutralized, while a large amount of sugar leading to a large amount of acid formed which is all neutralized will not cause caries. An increase in sugar, as shown by the report, will not lead to further caries provided the patient is on a well-balanced diet; and, conversely, neither will a decrease in the amount of sugar necessarily bring about a decrease in the caries rate. The disease is dependent upon a host of factors, far more than the report takes note of, but sugar in relation to the whole diet is still probably the most important factor. Admittedly the report only deals with additional sugar in the diet, but it must be noted that all the groups had an increase in the caries rate, the control groups in some cases having a greater increase

than the sugar groups. A point of vital importance is raised. These children were fed on what is referred to as a good average well-balanced diet. This fact must be queried. What is a well-balanced diet in relation to dental caries? Is it not possible that far from being well balanced our normal concept of this type of diet is in fact in imbalance? There is evidence to show that caries arise when the diet is not only high in carbohydrates but low in protein. In balancing a diet for caries not only must the carbohydrate be reduced but the protein must be increased. It is not sufficient just to reduce the sugar intake. If sugar is reduced in a diet it must be replaced with some other factor, preferably protein.

It is possible that an increase in protein may automatically ensure a reduction in carbohydrate in the diet by the patient, but an enforced cut in carbohydrate will not increase the protein intake. Might it not be possible that our ideas of what constitutes a well-balanced diet are ill conceived? Man is not a machine, but scientifically controlled diets assume him to be so. It is not a reappraisal of the theories of dental caries that is required as much as a reappraisal of diet in relation to dental caries. Let us hope that the M.R.C. will carry on this valuable research in the same meticulous fashion as is evidenced by this latest report.

WASTAGE IN THE DENTAL PROFESSION

By Professor P. J. STÖY, B.D.S. (U. Birm.), F.D.S. R.C.S.

MANY of the recent statements on the ageing of the dental profession and on the lowered intake into Dental Schools may give rise to a false impression of the ability of the present members of the profession to meet expected future demands. This in turn may lead to panic legislation. To me there does not seem to have been enough emphasis laid on the distribution of the active dental practitioners or of the actual contribution (in terms of volume of treatment given) of the various age groups. There must be many whose names

Table I.—NUMBERS OF PRINCIPALS (DENTAL) IN AGE GROUPS, NORTHERN IRELAND GENERAL HEALTH SERVICES BOARD

AGES AT MARCH 31, 1954	NUMBER ON LIST AT MARCH 31, 1954	AGES AT MARCH 31, 1954	NUMBER ON LIST AT MARCH 31, 1954
25 and under	2	51-55	20
26-30	35	56-60	29
31-35	56	61-65	20
36-40	34	66-70	21
41-45	25	71-75	14
46-50	19	Over 76	3

Total 278

appear on the *Dentists Register* who do little or any dentistry. For example, there are still 2 in the 1954 Register who were in practice in 1878-77 years ago—and the same Register shows 30 per cent of the names to be of dentists of 66 years and over. The inclusion of these names then must give a wrong idea, not of the age distribution, but of the percentage of active practitioners.

I have attempted to approach the problem of possible future shortage of general dental services in a more realistic way, using conditions in Northern Ireland as an argument simply because the necessary data was available to me. It may be that conditions differ considerably in Northern Ireland from the rest of Great Britain, but a similar method might be applied to England.

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To get some idea of the age distribution of active dental practitioners in Northern Ireland I used the names of those who were actually on the Lists of the Northern Ireland General

Table II.—AGE DISTRIBUTION OF ASSISTANTS

AGES AT MARCH 31, 1954	NUMBER ON LIST AT MARCH 31, 1954	AGES AT MARCH 31, 1954	NUMBER ON LIST AT MARCH 31, 1954
23	1	29	1
24	4	30	2
25	3	31	—
26	1	32	1
27	4	33	—
28	2	34	—
		35	1

Total 20

Health Services Board. Table I shows the age distribution of principals on this list at March 31, 1954.

Table III.—AGE DISTRIBUTION OF PRINCIPALS AND ASSISTANTS COMBINED

AGES AT MARCH 31, 1954	NUMBER ON LIST AT MARCH 31, 1954	AGES AT MARCH 31, 1954	NUMBER ON LIST AT MARCH 31, 1954
25 and under	10	51-55	20
26-30	45	56-60	29
31-35	58	61-65	20
36-40	34	66-70	21
41-45	25	71-75	14
46-50	19	Over 76	3

Total 298

Table II shows the age distribution of assistants at the same date.

Table III shows the combined age distribution. (Principals and assistants have been shown separately in Tables I and II as an assistant may not necessarily be permanently associated with General Dental Services and may move into School Dental Services or some other branch of dentistry.)

This age distribution of active practitioners as shown in *Table III* is compared with the age distribution of *all* dentists on the Register in Great Britain as shown in the *British*

Northern Ireland only 42 per cent are above this age; over 56 years the comparative percentages are 41 per cent and 29 per cent.

These figures suggest that in Northern Ireland at any rate there is no danger of a

Table IV.—COMPARISON OF DISTRIBUTION IN AGE GROUPS OF ACTIVE PRACTITIONERS IN NORTHERN IRELAND WITH THAT ON THE REGISTER IN GREAT BRITAIN

AGE	G.B. REGISTER	PRINCIPALS AND ASSISTANTS, N.I.
	per cent	per cent
76+	2	1
66-75	28	12
56-65	11	16
46-55	18	13
36-45	19	20
Under 35	22	38

Table V.—COMPARISON OF PERCENTAGES OF PRACTITIONERS IN NORTHERN IRELAND AND ON THE REGISTER WITH INCREASING AGE

AGE	G.B. REGISTER	PRINCIPALS AND ASSISTANTS, N.I.
Over 76	2	1
.. 66	30	13
.. 56	41	29
.. 46	59	42
.. 36	78	62
.. 26	100	100

Dental Journal, 1954, 97, Sept. 7, N.S.9 (Table IV).

Noticeable differences are at once apparent, e.g., amongst active general practitioners there is a gradually reducing percentage with increase

marked drop in the number of active practitioners in the next twenty years. One cannot, however, deduce the wastage of active practitioners from age group distribution alone. To get a reasonably accurate estimate of this

Table VI.—WASTAGE OF PRINCIPALS IN NORTHERN IRELAND OVER FIVE-YEAR PERIOD

AGE AT MARCH 31, 1954	NUMBER RETIRED UP TO MARCH 31, 1954	NUMBER DIED UP TO MARCH 31, 1954	NUMBER REMOVED UP TO MARCH 31, 1954	CEASED TO TAKE UP OTHER EMPLOYMENT UP TO MARCH 31, 1954	TOTALS
	(a)	(b)	(c)	(d)	
25-29	—	—	1	5	6
30-34	—	—	2	2	4
35-39	—	—	—	2	2
40-44	—	1	—	1	2
45-49	—	—	—	3	3
50-54	—	2	—	—	2
55-59	4	4	—	2	10
60-64	2	8	1	—	11
65-69	4	8	2	—	14
70-74	1	5	2	—	8
75-79	3	3	1	—	7
80	—	1	—	—	1
Totals ..	14	32	9	15	70

in age group, with no sudden increase in numbers in the 66-75 years decade as shown on the Register. A more revealing comparison is shown in *Table V*, from which it will be seen that whereas in the Register 59 per cent are over 46 years, amongst active practitioners in

wastage during the next ten years in Northern Ireland figures were obtained from the Northern Ireland General Health Services Board of all principals who had during the last five years retired, died, been removed, or had ceased to operate under the Scheme in

order to take up other employment. These figures are shown in Table VI.

They were then subjected to a statistical analysis by Dr. Cheeseman, of the Queen's University of Belfast, and his results shown in Table VII.*

The predicted loss is thus 63, for the first quinquennial period (= 13 a year) and 41 in

Table VII.—ESTIMATED WASTAGE OF PRINCIPALS IN NORTHERN IRELAND DURING NEXT DECADE

AGE GROUP	OBSERVED MARCH 31, 1954	PREDICTED MARCH 31, 1959	PREDICTED MARCH 31, 1964
20—	2	—	—
25—	27	2	—
30—	49	23	2
35—	44	45	21
40—	22	41	42
45—	24	20	38
50—	21	21	18
55—	23	19	19
60—	23	15	13
65—	23	14	10
70—	15	10	7
75—	5	5	4
80—	0	—	—
	278	215	174

the second quinquennial period (= annual loss of only 8). The recent annual intake of dental students at the Queen's University of Belfast is in the order of 17–18, so that it would appear that at the present rate of recruitment, and assuming no great increase in demand for treatment, the General Dental Services in Northern Ireland can easily be maintained at the present level, as far as numbers are concerned.

* His comments are included: "The following assumptions were made in these predictions:—

"1. All four 'exit' groups (a), (b), (c), and (d) were included.

"2. That the exit rate for 1954–9 and 1959–64 remains at the level observed for each five-year age group in 1948–54.

"3. That the age distribution of the exposed to risk for calculating exit rates can be derived from your schedule.

"4. That there are no new entrants between 1954 and 1964.

"I do not need to warn you that with these numbers the sampling errors could be large and that we are indulging in the luxury of long-term forecasting."

Table VIII.—COMPARISON OF PRODUCTIVITY OF DENTISTS IN VARIOUS AGE GROUPS
GROSS FEES EARNED BY DENTISTS IN 1953–4
(The table includes only Dentists and Assistants who gave a full year's service)

	Under 30	30–34	35–39	40–44	45–49	50–54	55–59	60–64	Total	35–54
	30 (a)	44 (b)	42	21	22	21	22	20	222	106
	86,420	134,090	123,809	62,260	63,691	58,371	36,517	40,442	605,600	308,131
Average fees	2,881	3,048	2,948	2,965	2,895	2,779	1,660	2,022	2,728	2,907
Average fees expressed as a ratio of those for the 35–54 age group	0.99	1.05	1.01	1.02	1.00	0.96	0.57	0.70	—	1.00

(a) Assistants included—8; (b) Assistants included—1.

It is widely held that the Medical School at Queen's trains doctors for export. If the same applied to dentists the assumption in the previous paragraph would not be valid. A check on the graduates of the last six years, however, shows that of 83 Northern Ireland born dental students only 3 have taken up practice out of Northern Ireland and 1 of these is in a teaching appointment. It can be assumed, therefore, that there is no great wastage at present by emigration.

Up to now no consideration has been given to the amount of the individual contribution of members of each age group. A broad indication of this is seen in the dentists' gross remunerations. An attempt has been made in *Table VIII* to estimate the "productivity" of dentists in each age group. The figures in this table relate to only 222 dentists, although 298 were on the lists: no less than 76 were not included because there were indications they had not given a full year's service. Of these 76, 43 were over 65, i.e., their contribution to the Service might be expected to diminish, 23 were under 35 so that their contribution might be expected to increase. These two groups would thus tend to cancel each other (in terms of contribution to treatment) and might, for this argument, be excluded. It is seen from the table that the productivity of the age groups 55-59 years and 60-64 years (i.e., those likely to retire from the Service in the next ten years) is only just above half of the groups under 34 years, i.e., those likely to enter. We have already seen that on a numerical basis the numbers entering the Service in Northern Ireland would more than maintain the present wastage. In terms of productivity the supply would be twice the wastage.

A similar treatment of figures of active dental practitioners in General Dental Services in England may lead to similar interesting findings, but if conditions in Northern Ireland are at all representative, there would seem no need for panic legislation with regard to maintenance of the General Dental Services.

It might be interesting to note the percentage of Northern Ireland dentists undertaking General Dental Services. The level of prosperity in Northern Ireland is lower than in

England, and this might be reflected in the low numbers of dentists engaged solely in "private practice". The Local List in the 1954 Dentists' Register for Northern Ireland includes 377 names. As there were 278 principals on March 31, 1954, the percentage of the profession so engaged is 74 per cent. If one includes assistants, the total number is 298 and the percentage engaged becomes 79 per cent. The total number of dentists in England engaged in the Service has been given as 9473 (Report of the Ministry of Health for the Year Ending Dec. 31, 1953, Pt. I, Cd. 9321). As the total number on the 1954 Register is 15,075 the percentage in England engaged in General Dental Services would appear to be much lower even when one has taken into account the number of practitioners in Scotland, Eire, and Northern Ireland. This lower percentage undertaking General Dental Services is an important point, because new entrants into the profession are more likely to go into General Dental Services than into "100 per cent private practice": which surely means that new entrants into the profession will tend to replace the wastage of this 9473 only.

This reinforces my impression that there is not such a likelihood of an acute shortage of practitioners developing as recent statements would imply. Although every step should be taken to encourage entry into the profession and to build it up to meet future increased demands, there is no immediate need to consider dilution or ancillary workers.

MINISTRY OF PENSIONS AND NATIONAL INSURANCE

Exchange of Mauve National Insurance Cards

FIVE million mauve National Insurance cards should now have been exchanged for new cards at local Pensions and National Insurance Offices.

Every year about 750,000 cards are exchanged more than three months late. Delay in surrendering cards means a good deal of extra work for the Ministry and expenditure of public money in following them up. It may also lead to delay in settling claims for benefit and even to loss of benefit.

AN UNUSUAL OUTGROWTH ON THE CROWN OF A TOOTH

By VOLMER LIND, L.D.S.

From the Department of Dental Histopathology, The State Dental School, Malmö, Sweden
(Head: Gösta Gustafson, Dr. odont., F.D.S. R.C.S. (Edin.))

A BOY aged 10 years presented with a projection on the labial aspect of his left maxillary lateral incisor which had erupted two months previously and was causing soreness of his lip.

The projection had been visible through the gum before the tooth erupted. In the opinion of the parents the projection had doubled in

surface of the tooth, but the surface of the extremity was irregular and yellowish in colour and resembled dentine or cementum. Radiography showed that the apex of the root was not closed (Fig. 2 A).

On the maxillary left central incisor, approximately at the centre of the labial

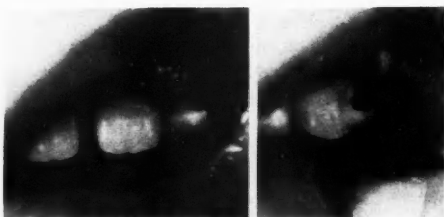


Fig. 1.—Photographs of the projection.



Fig. 3.—Decalcified section through the long axis of the projection. Pointed extremity to the left. ($\times 24$.) (Stained Mayer's hæmalum and eosin.)

size since the time of eruption. There was no history of disease or trauma which could be considered as a causative factor and all his teeth had erupted at the normal time.

Apart from the projection the lateral incisor was of normal form. The projection was situated in the centre of the labial surface and formed a pointed hook-like process about 4 mm. long with a base about 2.4 mm. in diameter. The pointed extremity was bent forward (Fig. 1). The base of the projection was smooth and appeared to be covered with enamel continuous with that of the labial

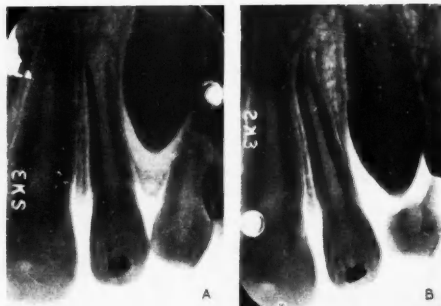


Fig. 2.—A, Radiograph shortly after the removal of the projection. B, Radiograph 2 years later, showing continued root formation.

surface, a depression about 1 mm. in diameter and 0.5 mm. deep was present. The crowns of the other teeth were of normal form.

The projection was observed for a period of a month, during which no dimensional change could be detected. The projection was then removed carefully with small burs. There were two minute depressions containing soft tissue at the site of removal, but it was not possible to establish whether they were connected with the pulp cavity.

A dressing of Calxyl was applied to the surface of removal and a month later a silicate filling was inserted. About two years later the tooth was still vital and radiographs showed that root development had been completed (Fig. 2 B).

The projection, which contained a shred of soft pulp-like tissue, was fixed in 10 per cent formalin, decalcified, and sectioned

approximately through its long axis (Fig. 3). It consisted mainly of dentine (Fig. 4) and, although the greater part appeared to have been

covered by a tissue resembling bone with cells in the lacunae and spaces containing a cellular connective tissue among its substance (Fig.



Fig. 4.—Area showing dentine with cavity containing granular material. Decalcified section. ($\times 230$.) (Stained Mayer's hæmalum and eosin.)

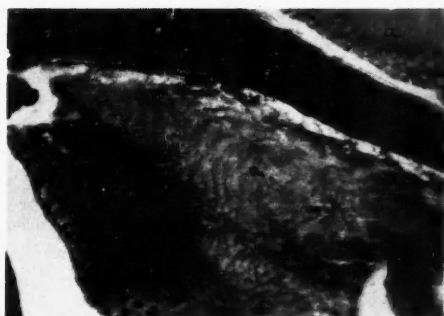


Fig. 5.—Area showing enamel matrix (a) in relation to lamellated bonelike tissue. Decalcified section. ($\times 220$.) (Stained Mayer's hæmalum and eosin.)

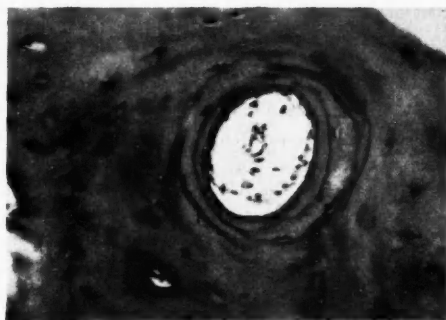


Fig. 6.—Area showing bone-like tissue with marrow cavity and lacunae containing cells. Decalcified section. ($\times 430$.) (Stained Mayer's hæmalum and eosin.)

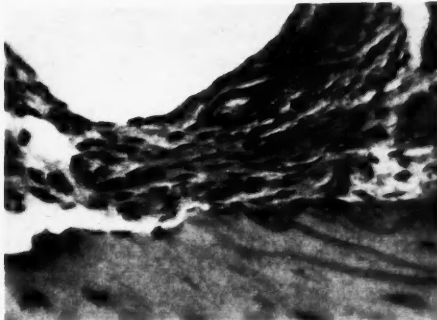


Fig. 7.—Area showing bone-like tissue with resorption bays related to which is a cellular connective tissue. Decalcified section. ($\times 430$.) (Stained Mayer's hæmalum and eosin.)

covered with enamel, in places dentine appeared to extend to the surface. The enamel was very irregular in structure (Fig. 5), and in some places it was surrounded by dentine. Much of the enamel did not disappear during the decalcification and was therefore possibly hypocalcified.

The dentine contained a number of cavities or channels, one of which communicated with the surface and was partly filled with a granular material (Fig. 4), the character of which it was impossible to determine. In some places the dentine and also the enamel were

6). Here and there both the dentine and bone-like tissue presented resorption bays (Fig. 7).

It is reasonable to assume that some connexion existed between the pulp of the tooth and the living tissue found in the projection. It is unfortunate that it was not possible to make a study of the structure of the tooth as a whole, which might have thrown some light on the process responsible for this curious condition. The absence in the literature of reports of similar cases would appear to justify placing on record such data as is available in this instance.

THE SOLDERING OF STAINLESS STEEL FOR REMOVABLE APPLIANCE CONSTRUCTION

By C. P. ADAMS, B.D.S., F.D.S.

THE use of soldered joints in stainless steel for orthodontic appliances brings with it certain technical difficulties. Firstly, no union takes place between solder and steel and as a result the solder, under the conditions of stress and strain found in the mouth and the action of the oral secretions, is liable to come away from the steel, leading to joint failure. Secondly, the heating of stainless steel to the temperature required for soldering anneals the steel and makes it useless for spring purposes at the annealed part. Heat treatment does not restore elasticity to the metal.

In the construction of removable appliances, soldering almost always refers to the soldering of wires, and here the two difficulties referred to can be overcome by good design of the joint and by accurate control of heat distribution during the soldering operation.

JOINT DESIGN

Wherever possible wires should be joined by turning one wire around the other and soldering the joint. This may seem a clumsy method, but the joint so formed is much more reliable than one formed by simply crossing the wires and soldering. The extra bulk formed by turning one wire around the other can be allowed for, and in some instances can be used to advantage as, for instance, in the stop-hook for intermaxillary and extra-oral traction. It will be noted, too, that in the construction of the extra-oral attachment for cervical traction to a removable upper appliance, a 1.25-mm. wire was bound to a 1.00-mm. wire with 0.3-mm. soft stainless steel wire and the whole joint then soldered (Adams, C. P., 1955). This method is useful in certain cases. Where a simple crossed or lapped joint is unavoidable, this may be made, of course, and good results are obtainable if the other principles of joint construction are attended to.

It is important when soldering wires to encase the joint completely in solder. The

solder on the outer aspects of the joint will be thin; but however thin, the solder must be present all round the joint. The mechanical continuity of the solder has much to do with the permanence of the joint. For this reason soldered joints should not be polished; polishing removes the outer layer of solder and exposes the wire. This makes a break in the continuity of the solder which, in the mouth, generally leads to failure of the joint. Flux should be removed from soldered joints when the joint has barely cooled, by picking it away with a probe; the solder will be found to have a bright, smooth surface which is perfectly clean and hygienic. It is not usually feasible or necessary to remove flux on soldered joints on appliances by boiling it off with alum solution.

HEAT CONTROL

The most convenient method of melting solder for stainless steel soldering is by means of the miniature blowlamp which burns coal gas and compressed air. The air jet in the blowlamp should be small enough to make it possible to produce a fine needle flame 1 cm. long when required. If the air jet is found to be too coarse, it may be bushed with stainless steel tubing, using 0.5-mm. internal tubing as the final jet size. Only low-pressure compressed air is required, but the importance of having a steady air pressure cannot be stressed too much. The imposition on the operator of the responsibility of blowing the flame increases the difficulty of an already delicate operation. It is much better to make the soldering flame one of the constant factors in the operation by using compressed air to produce a jet.

Only enough heat should be used to melt the solder and the use of a fierce flame should be avoided. A soft, quiet blue flame will melt solder quite adequately and give the operator time to observe the flow of the solder and manipulate the wires. Even slight overheating

of a joint produces burning of the wire and the solder, a weak joint, and a rough pitted surface on the solder. The control of heat application in soldering stainless steel is critical, as also is the manipulation of the wires and the application of the solder.

The final soldering operation should be performed if possible in one heating. Remelting a joint to add more solder or make adjustments increases the risk of burning the solder and the wire.

The localization of heat to the site of soldering is important when it is wished to avoid annealing a large section of wire, and where wires embedded in base-plates are being soldered. Heat may be localized by covering the adjoining wires with wet napkins or cotton-wool, or other blanketing material; by using a small flame; or by soldering rapidly and quenching the joint in cold water so that heat does not get time to travel down the wires. Another method of heat control is to melt solder on a separate piece of wire and to touch the wires to be soldered against the molten bead of solder. The molten solder will then flow onto the joint. This method provides both heat control and control of the amount of solder to be applied to a joint.

The annealing of stainless steel wire during soldering operations is related to two distinct uses of the wire. Firstly wires which are used as rigid arches, for example free sliding buccal arches, do not suffer from annealing because the wire is still strong enough when softened to resist the pressures of the forces applied to it. The same applies to wires, usually 0.7-mm. soft, used for hooks. Such wires are strong enough even when soft to withstand the pressure of intermaxillary traction. Secondly, finer wires used for springs when annealed become quite useless for their purpose. It is necessary when attaching such wires by soldering, to use only enough heat to melt the solder, so annealing as little of the spring wire as possible, and to wind the annealed part of any such spring around the arch before beginning to use the wire as a spring. If it is possible to use the turns of such a spring wire around the arch as the coils of the spring, so much the better. The annealed part of the

wire will then be well out of the way and unlikely to break down.

OTHER POINTS IN SOLDERING

If solder is first of all flowed around one or both of the wires to be soldered and the wires held in position, a gentle heat just enough to melt the solder will produce a perfect joint.

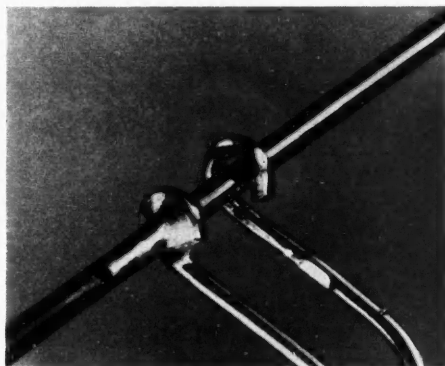


Fig. 1.—Soldering medium wire to thick. The medium wire is turned around the thick wire (right) and the loop soldered.

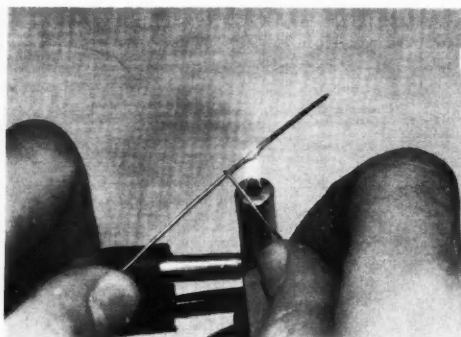
Flux must be applied liberally at all stages of stainless steel soldering. The flux/water mixture has a tendency to boil and leave areas of metal uncovered. This may be avoided by drying on a thick layer of flux by gentle heat before heating to soldering temperature and by cleaning just the area to be soldered with a fine cuttlefish disk or a fine smooth file. A wire so prepared will take a smooth and even layer of flux which remains evenly spread when molten. For small joints between wires it is not necessary to prepare the wire apart from wiping off surface dirt or grease. Stainless steel soldering takes place in a bath of molten flux which protects the metal and the solder from oxidation.

Soldering Medium Wires to Thick Wires.—

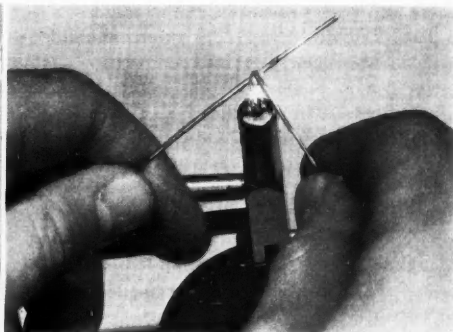
The medium thick wire is turned accurately around the thick wire, but not so tightly that it will not slide along the thick wire (Fig. 1). A bead of solder is melted onto the thick wire at the site of the joint (Fig. 2 A). The thinner wire is fluxed and brought near to the solder

bead, which is again melted and the loop in the thin wire is moved into the molten solder and heating continued for a second or so until the joint is uniformly covered with solder

thick wire at the site of the joint and both wires fluxed all round (Fig. 3). A piece of 1.25-mm. wire is filed flat across the end and a small spot of solder is melted onto the tip.



A



B

Fig. 2.—Soldering medium wire to thick. A, A blob of solder is melted on the thick wire; B, The looped wire slid into the molten solder and held for a second until the joint is complete. The joint may be soldered in one heating if necessary.

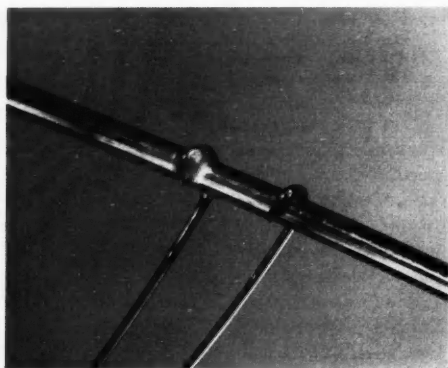


Fig. 3.—Soldering thin wire to thick. Right, fine wire clipped onto thick; left, the joint soldered.

(Fig. 2 B). The wires are withdrawn from the flame and held until the solder hardens.

If required, such wires as these or wires of equal thickness may be united without looping one about the other. It is necessary to make sure that the wires are completely encased in solder. Do not polish the joint.

Soldering Fine Wires to Thick Wires.—The fine wire is given slightly more than a half turn at the extreme end and clipped onto the

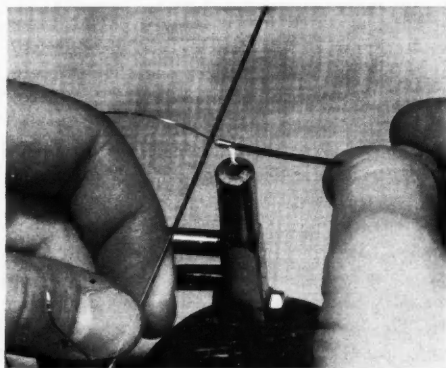


Fig. 4.—Soldering thin wire to thick. A piece of 1.25-mm. wire with solder on the end is heated in a fine flame and the molten solder touched onto the fine and thick wires which are clipped together; the solder will then flow onto the joint without overheating the fine wire.

This piece of wire is heated with a small, fine, fairly fierce flame just proximal to the bead of solder, which melts. The wires to be joined are held against the molten solder, which transfers itself to them without overheating the fine wire (Fig. 4). The wires are withdrawn from the flame and when cool the flux is

chipped off and the fine wire wound at least once completely around the thick arch, after which it may be used as a spring with or without further coils. By this technique it is

placing them on a longer length of finer tubing, or straight wire.

The area of tube to be soldered is coated with a thick blob of solder, *Fig. 5*, and the

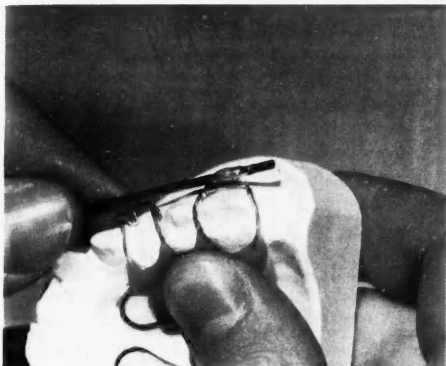


Fig. 5.—Soldering tubes to clasps. The tube is coated with solder and alignment tested.

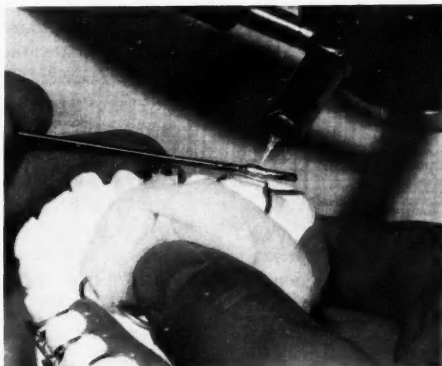


Fig. 6.—The baseplate is protected with a wet napkin and heat applied to the solder on the tube only, with a fine needle-pointed flame.



Fig. 7.—The solder flows around the clasp wire without the necessity of heating the wire itself.

possible to solder a 0.3-mm. wire to a 1.0-mm. wire without softening the 0.3-mm. wire.

The soldering of tubes to modified arrow-head clasps is strictly comparable to the joining of wires by soldering, and all the same considerations have to be taken into account.

A long length of tubing should be used, and the required section cut off after soldering. If it is desired to use up short lengths of tubing, these may be aligned and held in position by



Fig. 8.—The alignment of the tubes is simplified by using long lengths and allowing these to cross anteriorly.

tube tried on the appliance for alignment. The model on which the appliance was processed is preserved and used to assist in the alignment of the tubes.

The bridge of the clasp is then fluxed and, using a very fine needle-pointed flame, the solder on the tube is heated, when it will flow

onto and around the wire of the clasp (Figs. 6, 7). It is most important that heat should be applied only to the solder on the tube by means of a fine short needle-pointed flame. If the wire of the clasp is heated, the tags will lose their hardness and the clasp will not then remain tight when adjusted. The base-plate is protected by a well-wetted napkin arranged to cover it completely opposite the clasp and the two adjoining teeth.

The tubing must be alined to suit the curve of the arch in the buccal segments and also in the horizontal plane, to suit the level at which the bow being used must lie anteriorly. When one tube has been soldered, the alinement of the second in the horizontal plane is greatly facilitated, as the two lengths of tubing will cross anteriorly (Fig. 8), and it is only necessary to consider the alinement of the tube to suit the buccal segments.

The soldering of tubes to premolar clasps is done in exactly the same way. A little less

solder is required and it is not spread as far along the tube.

The author finds it most convenient when soldering tubes to have the flame coming towards him, as, holding the model and tubing in this way, it is easier to judge the alinement of the tube. There is a risk of burning the fingers or clothing accidentally, however, and others may prefer to have the flame pointing in the opposite direction.

For the sake of clarity in the illustrations flux has been omitted in all the soldering operations. Flux must, of course, be applied liberally as mentioned earlier in the article.

The author is greatly indebted to Mr. D. R. McDougall, A.I.B.P., of the Photographic Department, Institute of Dental Surgery, London, for his care in the preparation of the illustrations for this paper.

REFERENCE

ADAMS, C. P. (1955), *Dent. Pract.*, 5, 244.

Partial Denture Design in Relation to Occlusal Trauma and Periodontal Breakdown

In the construction of partial dentures the following principles are recommended:—

1. Before the impressions are taken, a full diagnosis and treatment of the mouth, including establishment of a harmonious state of occlusion, should be carried out.
2. Non-essential dentures and free-end saddles should be omitted.
3. Wherever possible fixed bridges are to be recommended.
4. Remaining teeth should be splinted, and if necessary their crowns shortened or covered by means of onlays, etc., for the omission and distribution of transverse forces.
5. Maximum dental support to be secured.
6. Maximal extension of free-end saddles should be provided.
7. The denture base, clasps, etc., should be constructed with a view to mouth hygiene.
8. A simple and robust design is to be preferred.
9. Cast partial dentures are usually preferable to those made with bent bars and wire clasps.

10. Clasp arms should exert the same pressure from two opposite sides of the tooth, but they should be passive when the denture is at rest.

11. The design of the partial denture should be such as to splint weak natural teeth and secure a balanced distribution of the horizontal components of force which will prevent periodontal breakdown.

12. The fulcrum line should pass through the middle of the supporting area of the denture.

13. Reduce the extent of the occlusal table to be restored, if the biting force is greater than normal.

14. To avoid failures a rationalized treatment planning and denture design is to be carried out.

15. Careful instructions regarding mouth hygiene and care of the denture should be given to patients.

16. The patient should be asked to return twice a year for a routine examination so that the denture can be relined if necessary.—KROUGH-POULSEN, W. (1954), *Int. dent. J.*, Lond., 4, No. 6. 849.

DENTAL BOARD OF THE UNITED KINGDOM

Chairman's Address at the Opening of the Sixty-eighth Session, May 11, 1955

GENTLEMEN,

In this Address it is not usual to record the loss of colleagues unless they have been members of this Board or been closely associated with us in the transaction of our affairs; but on this occasion I want to make an exception. By the death of Sir Alexander Fleming we have lost one who has rendered an incomparable service to dentistry, and not only to dentistry but to all mankind and to our descendants for ever. Those of us who knew him and worked with him and shared that first amazed realization that he had introduced a new epoch in medicine do not only think of him as the brilliant research scholar to whom humanity owes the greatest medical discovery of the century, if not of all time, but we remember him as a good companion, unassuming and cheerful, always ready to help a cause or take part in a celebration. It is fitting that we should pay our tribute here to his immortal memory and give thanks that we have lived to see the glory of his discovery.

It is my sad duty to refer also to the death of Sir Edward Mellanby, who was Secretary of the Medical Research Council from 1934 to 1949. Before he took up that onerous appointment he was the first occupant of the Chair of Pharmacology at Sheffield, which he held with great distinction for fourteen years. It was very soon after his appointment to Sheffield that his first report appeared on experimental rickets in the Medical Research Council special report series. It is difficult to select from the many aspects of nutrition on which he worked any one on which special emphasis should be laid, but his work from 1915 to 1919 on fat-soluble substances in food which control the deposition of calcium in the bones is undoubtedly the revelation which influenced dental thought and practice most. From the time when Sir Edward became Secretary until the outbreak of war in 1939 the Dental Board made their financial contribution to dental research through the Medical Research Council, and in this way they came into close contact with the Secretary; but the part of Sir Edward's work which was developed by Lady Mellanby, who from their early days in Sheffield had worked closely with him, is the one with which all dentists are most familiar. It was she who observed and described the importance of vitamin D in the calcification of the teeth. We extend to her in special measure our sympathy in her deep sorrow and renew our acknowledgement of the great debt we owe to her and her brilliant husband.

During the past few months the deaths have been announced of three other distinguished men each of whom gave encouragement to our profession at that crucial stage in its development, immediately following the passage of the Dentists Act of 1921. The first of these, Sir Arthur Keith, though he was not a member of our profession, gave in London, Manchester, and Edinburgh one of the series of post-registration lectures planned by this Board for the benefit of the eight thousand dentists whose names were then included in the register for the first time. It is a measure of his generosity and breadth of vision that, at the height of his career, this world-renowned anatomist and anthropologist found the time to place his immense learning and unrivalled powers of exposition at the disposal of a young profession in its time of need.

The second of these whose death I have to record is Professor Evelyn Sprawson, who was nominated by the Royal College of Surgeons of England to be one of the panel of examiners for the "prescribed examination" for admission to the register under the same Act of Parliament. I have referred in a previous Address to the efficiency and expedition with which this tremendous task of examination and registration was carried out; that it was so accomplished was due to the experience, skill, and untiring application of the examiners. In this undertaking Professor Sprawson exhibited those qualities of administrative ability and kindness which, together with his skill as a teacher, were to bring him success as Professor of Dental Surgery and Pathology at the London Hospital and as Chairman of the London University Board of Studies in Dentistry. In addition to his large share in keeping the famous text-book up to date, Professor Sprawson was also responsible for the illustrations and diagrams appearing in *Hygiene of the Mouth and Teeth*, a book for teachers first published in 1927, which has been in constant demand and which the Board are only now, after nearly thirty years, finding it necessary to supersede.

The third distinguished colleague who, like Sir Arthur Keith, gave one of the series of post-registration lectures with which the Board first manifested their concern to maintain high standards of dental education, was Mr. J. G. Turner. He was a kindly, serious, thoughtful man, for many years a pillar of strength at the Royal Dental Hospital, where he lectured in dental surgery for something like a quarter of a century. It is to his father, James Smith Turner, also a consulting dental surgeon at the Royal, that in large measure we owe the Act of 1878. J. G. Turner in all things maintained the family tradition: for 65 years he was a member of the British Dental Association which his father helped to found, and he took an essential part in developing dental research on modern lines at his father's old Hospital. He was the essential link with those famous friends of his father, John and Charles Tomes, and a contemporary of Mummery and Hopewell Smith. We tender our sympathy to Mrs. Turner and accord him a place amongst these distinguished men who laid the foundations of our profession.

The Board will have learned with regret of the death of Mr. Thomas Kemm, who, after serving an exacting apprenticeship with the Middlesex County Council, entered the services of the Board in 1922 and for a quarter of a century watched jealously over our finances. The records of our bursaries' scheme, in particular, are a monument to his administrative efficiency and to the meticulous attention to detail which was an example to all who worked under him. But Kemm never allowed his insistence on a high standard of accuracy to obscure his essential friendliness or his appreciation of the full life, and it is a matter of profound sorrow among all of us who knew him that his enjoyment of the leisure he so well deserved was cut short by the long and cruel illness to which he has now succumbed. We extend our deepest sympathy to his widow in her great loss.

We all greatly regret that Mr. Michaels' transference from the Ministry of Health to another Department has necessitated his resignation from the Board. M. I. Michaels was appointed in 1950, and during his years among us we have experienced from him not only that

clarity of thought and incisive, independent judgement which we have come to expect from the Minister's nominee, but something more: a valued friendship, a warm interest in our affairs, and a readiness to devote time and energy to our problems which we deeply appreciated and found especially gratifying in a colleague whose occupation brought him so many other problems with which to grapple. Our gatherings will be the poorer for the loss of his informed good sense and friendly presence. We thank him for his help and wish him well in his new and important post.

The appointment made by the Minister of Health is one of particular significance for us. Not only is it the two-way channel for liaison with the Government Department with which we are most closely concerned, but it brings to our counsels a colleague, often, indeed, somewhat younger in years than most of us, but with a mind disciplined in the hard school of administration and rich in experience of institutions different from ours. It is a pleasure to welcome to Mr. Michaels' empty chair his successor in his departmental office, Mr. A. N. Roffey; we do so with confidence that he will maintain the tradition of close and cordial co-operation with the Ministry which his predecessors have done so much to establish.

It is a pleasure also to congratulate Mr. Shuttleworth on his promotion to the rank of Assistant Secretary in the Northern Ireland Civil Service, particularly as I am assured that his increased responsibilities will not prevent him from continuing to serve as a member of the Board.

I should like to refer to a long and eagerly awaited event which took place at the end of last year; I mean the opening of the Dental School at Queens College, Dundee, in the University of St. Andrews and the re-opening of Dundee Dental Hospital, modernized and greatly enlarged. At a time when it is becoming ever more generally realized that the health services of the United Kingdom call for a great increase in the number of dental practitioners it is encouraging that such up-to-date and attractive accommodation should have been found for their training. We congratulate those whose energy and vision have made the new dental school a reality and we wish it a long and prosperous career under its Dean, Professor Hitchin, and his successors. Scotland is to be congratulated, too, and perhaps a little envied, that it should have brought all three of its dental schools into line with modern thought and practice.

The number of names in the Dentists Register at the beginning of this year was 15,693, additions during 1954 having exceeded deletions by 144. The number of dentists with United Kingdom degrees or diplomas first registered last year, 535, was only slightly above the number in 1953 and well below the peak attained in 1951 and 1952. This is in accordance with the forecast I gave a year ago, when I said that a further improvement was to be expected before the decline set in, a decline which will not show in the Register until 1958. There was also, once again, an increase in the number of new registrations in what we must still officially call the Colonial List. Last year registration in this category had fallen sharply but the access of these new recruits has had the effect of making the 1955 Colonial List the largest ever recorded. The average length of stay of the majority of those who register with Commonwealth qualifications appears to be about two and a half years.

The number of names removed from the Register last year was considerably smaller than the number removed in 1953, which had included our periodical check on practitioners registered before 1921. It was, however, a

little above the average for the preceding five years. It appears that events have conspired to keep the Register at the exceptionally high level which it has reached after overcoming the effects of the last war, and in fact this year's Register is larger than any of its seventy-six predecessors. I must, however, reiterate that nothing can prevent a considerable increase in the rate of deaths and retirements among practitioners during the next few years, just as nothing can prevent a considerable decline in the number of new entrants from the dental schools.

It is nevertheless possible to view the problem of recruitment to our profession somewhat less pessimistically than in recent years. In the first place, a Government Committee has been set up to consider this problem and has already begun its work. Later in this Session you will be asked to consider a request that the Board should submit evidence to that Committee. In the second place, progress is being made with the various measures which we ourselves have concerted to encourage young people to consider making a career for themselves in dentistry. We have received a preliminary report of the comprehensive survey which has been carried out among practising dentists, students of dentistry and medicine, sixth-form boys and girls, parents, teachers, and others who might be able to shed light on the subject and this, when we have had an opportunity of studying it, will at least make us better acquainted with the obstacles in the way of recruitment and of ways in which we may seek to surmount them. Moreover, acting upon our belief that ignorance of the nature of dental practice and of the opportunities offered by a dental career is one of the first obstacles to be overcome, we are preparing an informative booklet for distribution to schools which, if authority were given during this session, could be made available to the appropriate members of the public during the next few months. Other measures will be brought before us for our approval, and yet more are in course of preparation by the Sub-committee appointed for this purpose who deserve our thanks for the considerable time and energy which they are devoting to the work.

Perhaps an equally important reason for optimism may, however, prove to be that some of the dental schools themselves have undertaken the task of attracting students; and have taken steps to ensure that the sixth-form scholars in the schools around them are given an opportunity of seeing a dental hospital at work and deciding for themselves whether they would like to enter the profession. There is reason to believe that some improvement is already showing itself in the figures of entrants into the dental schools. This at present is local and may prove to be only transitory; it has indeed been suggested that it may result from the general belief that there is, just now, a diminution of opportunity in medicine. We must, however, remember that even if every place in every dental school were regularly filled, the number of entrants into the profession would still not be much more than two-thirds of the number thought necessary ten years ago, before the Health Service had shown how great the national need for dental treatment is. We have in fact a long way to go before a solution is in sight or we can view the situation with confidence.

Members of the Board will have noticed with regret that an unfortunate misinterpretation was placed on a "Special Report" of the Medical Research Council in recent articles in the Press. The Special Report showed that the sugar content of the diet, whether increased or decreased, did not affect the incidence of caries in certain groups of children; but in the Press reports it seems to

have been overlooked that the sugar was "taken as ordinarily consumed in the diet". The investigation did not even explore, let alone condone, the indiscriminate consumption of sweets between meals or a chocolate at bedtime; yet I fear that by assuming it did some of these newspapers reports may have undone much of the good accomplished in many patient years of public instruction by the Board on which we have expended thousands of pounds, contributed by dentists, in an endeavour to save the children's teeth. I am glad to be able to add, and it is some small consolation, that when this was pointed out to them, the newspapers did what they could to retrieve the situation.

You will be interested to learn that, as a consequence of the number of disciplinary cases involving dental companies which have come before us, a letter is now being sent to registered dentists who are listed as directors of such companies. They are being reminded of their responsibility to ensure that the business of their companies is conducted in accordance with the accepted code of professional ethics. One result of this has been the discovery of still more practitioners who were listed as directors without being aware of the fact. Another has been the resignation of their directorships by a number of practitioners who have been unwilling to accept the responsibility which that office carries with it.

ANGLE'S CLASS II, DIV. 1 AND CLASS II, DIV. 2 IN IDENTICAL TWINS*

By H. L. LEECH, B.D.S., F.D.S., Dip. Orth.

It is generally accepted that factors which are genetically determined play a major role in

hereditary as well as environmental factors." With these thoughts in mind I present to



Fig. 1.—Photographs of the twins C. and M., showing the striking similarity of appearance.

growth and development, which includes the development of the facial bones and the occlusion of the teeth, normal and abnormal.

To quote Professor Anders Lundstrom (1947-8), "... the causes of malocclusions seem to a high degree to be hereditary in nature". "It is presupposed that the differences between identical twins, who have the same genetic constitution, are caused only by environment, while corresponding differences between fraternal twins depend on

you the following case histories of a pair of identical twins.

CASE REPORTS

On presentation, C. and M., girls aged 13 years, showed a striking similarity of appearance, including such special features as the shape of the ear, the colour and texture of the hair, colour and markings of the iris, shape of nose and chin, shape of hands and nails, etc. (Fig. 1).

Although this similarity applied to the morphology of the corresponding teeth themselves, the occlusions of these teeth were remarkably different, C. possessing a marked Angle's Class II, Div. 1 (Fig. 2), and M. a marked Angle's Class II, Div. 2, malocclusion (Fig. 3).

Further evidence that they were indeed identical or monozygous was sought, and was confirmed from a history of a common placenta and from blood-tests of

* Given at the meeting of the British Society for the Study of Orthodontics on Monday Feb. 14, 1955.

all the family for genotyping. Nine different blood groups were examined and it was found that those of the twins were identical. It was assessed that the odds that these twins were identical were 200 to 1.

FAMILY HISTORY.—There was no other history of twinning and the parents were not related. The other

child, a boy aged 16 years, was quite different in appearance, with a Class I malocclusion with crowding.

INDIVIDUAL HISTORIES.—

Birth Weight: C., 6 lb. M., 5 lb. M. was first born by 10 minutes.

Feeding: Both mainly bottle fed.

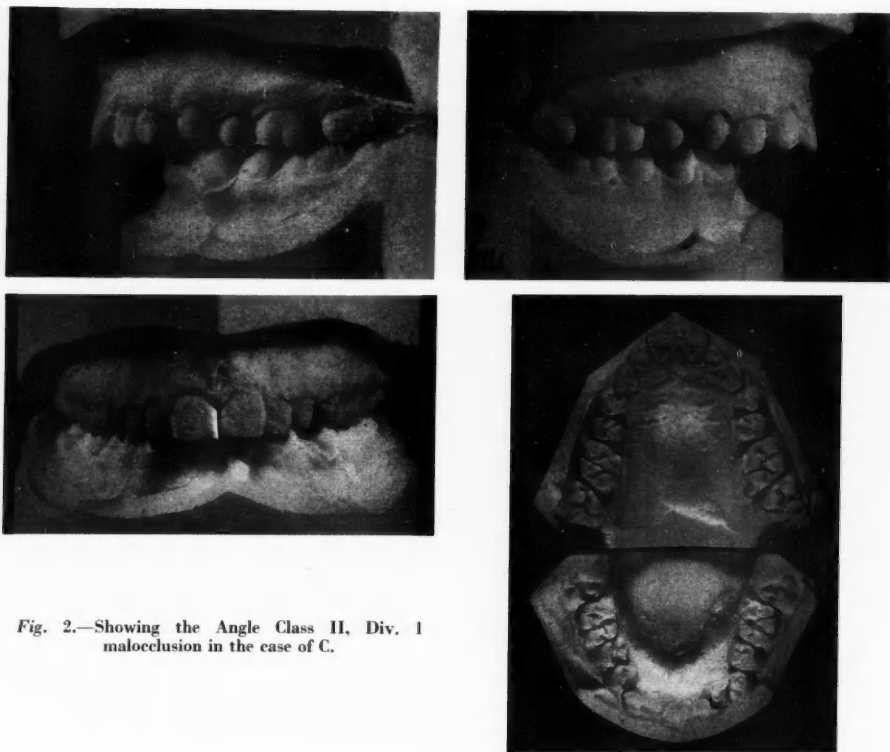


Fig. 2.—Showing the Angle Class II, Div. 1 malocclusion in the case of C.

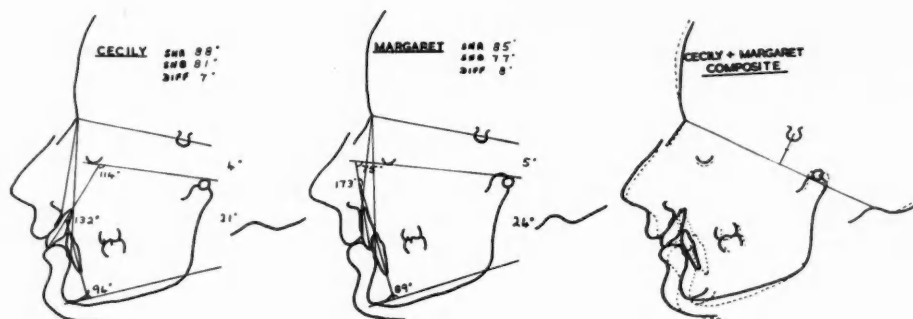


Fig. 4.—A comparison of the skeletal patterns.

Illnesses: Usual childhood illnesses. Both had tonsils and adenoids removed at 3½ years.

Habits: Nil. No history of thumb-sucking in either child.

Walking and Talking: Both late.

Eruption and Shedding of Deciduous Teeth: Both normal.

Eruption Times of Permanent Teeth: Normal in both.

Injuries to Teeth: None in either.

PRESENT CONDITION.—

C., Class II, Div. 1. M., Class II, Div. 2.

Height: C., 5 ft., 2½ in. M., 5 ft., 1½ in.

Weight: C., 7 st. 11 lb. M., 7 st.

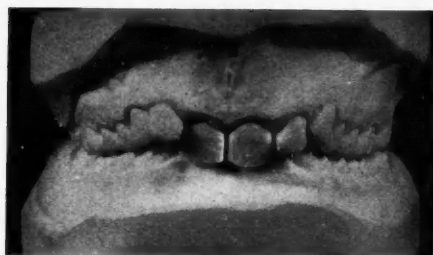


Fig. 3.—The Angle Class II, Div. 2 malocclusion in the case of M.

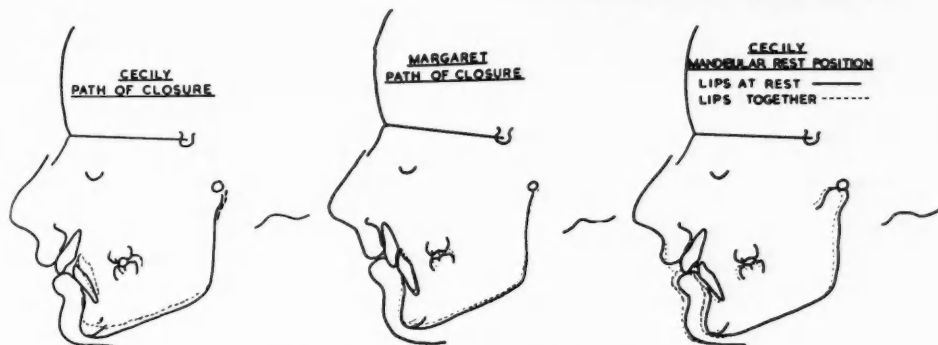


Fig. 5.—A comparison of the paths of closure.

Dexterity: C., Right handed. M., Left handed—throwing (right handed—writing).

Sight: Both myopic to a similar degree.

Caries Incidence Rate: Both low.

Periodontal Condition: Both good.

Skeletal Morphology: Fig. 4.

Both are Skeletal Class II with square-angled mandibles. The typical incisor relationships show the proclination of the upper incisors with increased overjet

Occlusal Patterns: These are shown very well from the study models.

*Resting Muscle Patterns (Fig. 6).—*The rest position of the lips is fairly similar in both cases, with slight incompetence in the case of C. There is a tendency for the upper incisors to rest just over the lower lip in the Div. 1 case, and just behind in the Div. 2.

*Muscle Behaviour Patterns (Fig. 7).—*C., the Div. 1 girl, had an atypical swallow with the buccal teeth apart



Fig. 6.—Showing the position of the lips at rest.

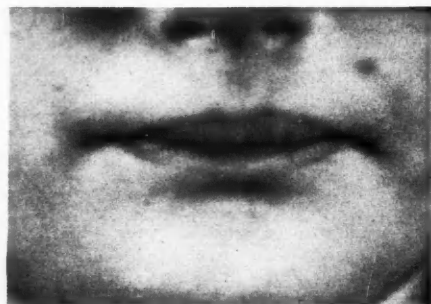


Fig. 7.—Showing the position of the lips during swallowing.

and overbite in the one, and the double retroclination with increased overbite in the other.

The composite tracing shows the close similarity of the skeletal patterns apart from their incisor relationships. The superimposition was both on the Bolton planes with registration points, and the S-N planes in the same composite.

Freeway Space: C., 6 mm. M., 3 mm.

Path of Closure (Fig. 5): C., Upwards and backwards. M., Directly upwards.

An interesting sideline is that in C.'s case two radiographs were taken with the object of securing the physiological rest position of the mandible; one with the incompetent lips at rest, and the other with them together. In the latter case, the mandible was postured forward subconsciously into a false resting position, as demonstrated by Ballard (1951). This may explain the downward and forward resting position of the condyle on the eminencia articularis in Class II cases as shown by Ricketts (1952).

a tongue thrust between the upper and lower incisors, and contraction of the lower lip between the upper and lower incisors.

M., the Div. 2 girl, contracted the lips on swallowing, but with the lower lip against both upper and lower incisors. The buccal teeth were together and there was no tongue thrust.

An electromyographic analysis with two-channel electrodes showed contraction impulses from the lips in both cases. Contraction impulses from the temporalis and masseter muscles, however, were apparent only in the Div. 2 case.

Comment.—This case supports the view that skeletal and muscle morphology is genetically determined. The cause of the different types of malocclusion seems to point to the different muscle behaviour patterns.

I have discussed the case with an eminent geneticist, who is of the opinion that muscle behaviour may be only in part genetically determined.

He quotes the incidence of club-foot when occurring in twins. The ratio of it occurring in both twins is 1 in 50 in fraternal, and 1 in 4 in identical, i.e., it is very much more likely to occur in both twins when they are identical but not in every case.

May I close by saying that I would be most unwise to attempt to prove or disprove established concepts from one single case, and I present this short paper to you in the hope that it will stir your thoughts and maybe bring similar cases to light.

I would like to thank Mr. Hovell, the Director of the Orthodontic Department of the Royal Dental Hospital, for permission to publish this paper, and Mr. Walther, Reader in Orthodontics, for his help. My thanks are also due to the Photographic, X-ray, and Pathological Departments. I am also grateful to Dr. J. N. Marshall Chalmers, of St. George's Hospital, and Dr. R. R. Race, of the Lister Institute, for the blood group genotyping.

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Increased Training Facilities An Urgent Need

Canada requires an increase in training facilities for dentists and hygienists. The five dental schools are capable of graduating about 212 dentists per year. In 1954 new graduates numbered 83 in excess of those dentists who ceased to practise through death or retirement: in 1953 the net increase was 144; but, because of the tremendous rise in the Canadian population figures, resulted in a worsening ratio of patients to dentists in each successive year.

DISCUSSION

Mr. R. E. Rix asked Mr. Leech whether there was any difference in the histories of the twins as far as upper respiratory infection was concerned subsequent to the removal of the tonsils and adenoids. There did not seem to be a gross difference in the fundamental behaviour of the musculature in swallowing, but for the accident of the lower lip being caught beneath the upper front teeth, which were so very much proclined in C.

Mr. C. F. Ballard said he thought that in the film which Mr. Leech had shown there was very little evidence of a tongue thrust in either case. In the Class II, Div. 1 case the patient was constantly swallowing and there was only sufficient tucking in of the lower lip to produce an anterior oral seal with the increased overbite.

Occasionally one saw an individual who had the typical morphology of a Class II, Div. 2 case, but by mere chance, as it appeared, one central incisor was proclined, resting on the lower lip, and the other central incisor was retroclined, resting inside the lower lip, and the lateral radiograph showed a surprising difference in the position of the apices. In the case of the retroclined incisor the apex was labially placed, whereas in the case of the proclined incisor the apex was lingually placed. It seemed that the two cases which Mr. Leech had shown could together represent that type of case.

The President asked whether there was any difference in the width of the upper dental arch in the two cases which Mr. Leech had shown.

Mr. H. L. Leech, in replying to the discussion, said that the histories of respiratory infection after the removal of tonsils and adenoids were very similar in the two cases. There was no definite history that one was different from the other.

It might be a pure accident which determined whether the upper incisors erupted inside the action of the lower lip or outside the action of the lower lip, but he felt there was very much more to it than that.

In the Class II, Div. 1 case that he had shown there was a tongue thrust, but he thought that the increased incisor overjet was due as much to the contraction of the lower lip under the upper incisors as to the tongue thrust.

The models of the two cases were very nearly interchangeable. A surprising point was that it was the Class II, Div. 1 case which had the wider arch, but it was only slightly wider.

At the recent Board of Governors meeting of the Canadian Dental Association, the Board once more reiterated its position in respect to an increase in teaching facilities. The resolution stated the Association's awareness of an acute shortage of dental personnel, lack of expansion in existing teaching facilities for many years, and that these responsibilities rest upon governmental and university authorities. These bodies are urged to give these problems their attention because the need for the provision of dental treatment in many parts of Canada is desperate.—EDITORIAL (1954), *J. Canad. Dent. Ass.*, **20**, 622.

PEMPHIGUS OF THE MUCOUS MEMBRANES

REPORT OF A CASE ASSOCIATED WITH ALOPECIA UNIVERSALIS: AND A TRIAL OF ACTH AND CORTISONE

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PEMPHIGUS is a disease of unknown aetiology characterized by the rapid collection of fluid-forming blisters and bullæ in the skin and mucous membranes. There is no clear distinction between the different forms of pemphigus, and even other bullous eruptions such as the variants of erythema multiforme

disease with bullæ of varying size and haphazard distribution occurring in successive crops on apparently normal skin and mucous membrane. The bullæ usually contain thin straw-coloured fluid; they rupture, crust over, and finally heal. Pemphigus vegetans and pemphigus foliaceus are variants of

Table I.—INCIDENCE OF ORAL LESIONS

AUTHOR	NUMBER IN SERIES	INITIAL LESION IN THE MOUTH	LESIONS PRESENT IN THE MOUTH AT SOME TIME DURING THE DISEASE
Trautmann (1911)	222 All types	per cent 53	per cent 75.5
Lever (1942)	35 Chronic type 33 Acute type	11.5 54	51 85
Lever and Talbott (1942) ..	114 All types	25	54
Stern (1949)	47 All types	56	83
Coombes and Cannizares (1950)	100 All types	36	92

and dermatitis herpetiformis. The disease may, however, be divided into acute and chronic forms.

The acute or malignant form is a fulminating bullous eruption involving skin and mucous membranes, and associated with a high temperature. Though the patient may survive several weeks, the outcome is invariably fatal.

The chronic or benign form is not necessarily fatal and may continue with exacerbations and remissions over a period of many years. Spontaneous cure may occur, or the disease may become acute, with a fatal issue.

There are several types of chronic pemphigus recognized, and in all of them the oral mucous membranes may be involved. Pemphigus vulgaris is the commonest type of the chronic

pemphigus vulgaris, the former being characterized by granulomatous vegetations in the ruptured bullæ and the latter by an associated generalized exfoliation of the cornified layers of the skin.

Pemphigus mucosæ is another variety of chronic pemphigus, and it is a case of this type which is recorded in this article. Pemphigus mucosæ is synonymous with pemphigus conjunctivæ, maladie de Brocq-Duhring, and essential shrinkage of the conjunctivæ, and was first described by Von Kries in 1878 (Klauder and Cowan, 1942).

The mucous membranes of the body are primarily involved; those of the mouth, pharynx, and conjunctiva being most commonly affected. The skin itself is only

rarely attacked, the bullæ being localized in their distribution, and unlike other forms of pemphigus they tend to produce scarring (Lever, 1942).

A knowledge of the relatively uncommon disease of pemphigus is of some importance to dental surgeons. A high proportion of cases of all types of pemphigus reported in the literature show involvement of the buccal mucous membrane at some stage of the disease; of these a large number show the initial lesion in the mouth. The condition therefore must be considered in the differential diagnosis of buccal ulceration.

Table I summarizes the incidence of oral lesions in five series of cases reported in the literature.

CASE REPORT

PREVIOUS HISTORY.—Mr. W., aged 54, had always been a very fit man, with no serious illnesses in the past. In 1943, while working as a builder's labourer he fell from a ladder and was badly shaken, but did not lose consciousness and was fit enough to be back at work the following day. About two months later his hair started to fall out, and four months after the accident he was completely bald, having lost his eyebrows, eyelashes, and axillary, chest, and pubic hair. Throughout this period he felt quite well and continued working.

In August, 1952, he started to get a sore mouth and throat and to lose weight, eventually consulting his own doctor and dental surgeon, who tried various local and general treatments without success. The patient was referred to Rookdown House, being first seen by us on June 10, 1953.

CONDITION ON ADMISSION.—Largely owing to his complete alopecia and his loss of weight, he looked much older than his age (Fig. 1). Eyebrows and lashes were absent, and there was no axillary or pubic hair. There were a few silky hairs on the chest, behind the ears, and on the backs of the hands. The finger nails were hypoplastic, with whitened opacities and longitudinal ridging. There was also evidence of considerable loss of subcutaneous fat, particularly over the chest wall and ischiorectal region.

A careful systematic general examination was made and nothing of note detected. Particular attention was paid to skin and mucous surfaces, the skin being clear except for the presence of three superficial septic spots on the scrotum, whereas the rectal mucosa and the conjunctivæ were normal.

INTRA-ORAL EXAMINATION.—This revealed a dirty neglected mouth with the following teeth standing:—

7	4		3	5
7	321		1234	8
			xx	

Numerous areas of ulceration were present on the fauces, soft palate, buccal sulci, gingivæ, and cheeks. The tongue and the floor of the mouth were not involved. The ulcers were superficial, with outlines of extreme irregularity and size owing to their confluence in a

number of cases. They had shallow shelving edges, the bases being covered with a yellowish slough associated with a marginal hyperæmia. There was evidence of scarring of the soft palate and faucial regions.

SPECIAL INVESTIGATIONS.—The following special investigations were carried out:—

Hæmatological Examination.—R.B.C. 4,360,000 c.mm., W.B.C. 10,000 c.mm. Differential white count: Neutrophils 80 per cent; Lymphocytes 11 per cent;



Fig. 1.—Patient showing alopecia universalis.

Eosinophils 2 per cent; Monocytes 7 per cent. No abnormal cells seen. Hæmoglobin, 12.6 g. per cent. Corrected E.S.R. (Wintrobe) 12 mm. per hour. Wassermann reaction negative.

Bacteriological Examination.—This examination of the ulcerated surfaces revealed nothing of positive value.

A Gram stained smear showed Gram-positive cocci. Ziehl-Neelsen stain revealed no acid-fast bacilli. Aerobic culture gave a vigorous growth of hemolytic streptococci.

Biochemical Investigation.—Serum-sodium, 318 mg. per cent; Serum-potassium, 20.5 mg. per cent; Total serum-proteins 6.75 g. per cent, Albumin 4.0 g. per cent, Globulin 2.75 g. per cent. Urinary 17-ketosteroids (24-hr. specimen) 10.1 mg.

Histological Examination.—It was not possible to obtain a biopsy of an intact vesicle from the mouth. Biopsy of an ulcerated area showed a non-specific ulceration with subacute or chronic inflammatory infiltration.

Radiological Investigation.—The chest film and a lateral skull X-ray film taken to show the sella turcica demonstrated no abnormality.

Owing to the lack of facilities, the phyto-pharmacologic test of Pels and Macht (1943) was not performed.

None of these investigations was helpful in making a positive diagnosis, although the lowered serum-sodium level associated with the slightly elevated serum-potassium level and the low urinary output of

17-ketosteroids was suggestive of some diminution in adrenal function.

PRELIMINARY OBSERVATIONS

The infected teeth and roots were removed, and the oral mucous membranes watched carefully from day to

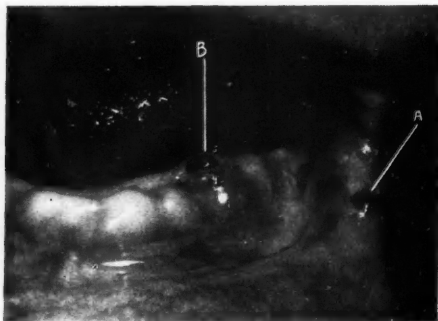


Fig. 2.—A, Papule on normal labial mucosa; B, Vesicle on gingiva.



Fig. 3.—Newly ruptured vesicle in palate.

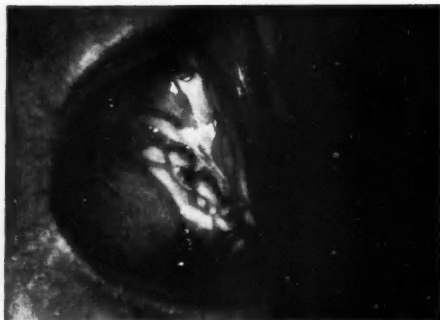


Fig. 4.—Secondary infection of ulcerated surface.



Fig. 5.—Secondary infection of ulcerated surface.

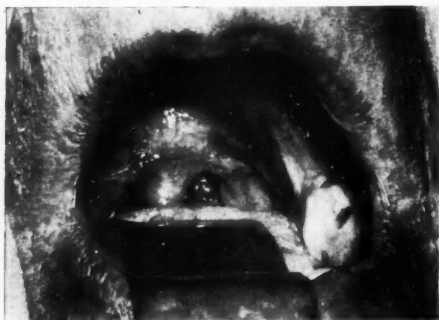


Fig. 6.—Post-ulcerative scarring of soft palate and fauces.



Fig. 7.—Superficial layers of buccal mucosa detached by rubbing with gauze swab.

day. It was noted that a fresh lesion started as a reddish-blue papule (Fig. 2 A), appearing on a normal looking area of mucous membrane. A rapid formation of a thin-walled vesicle (Fig. 2 B) followed. This was only rarely observed owing to the lack of keratinization present in the normal oral mucous membrane. Consequently the vesicles were covered only by an extremely attenuated layer of epithelium, which was soon ruptured by the trauma of mastication. The ruptured walls of the vesicle remained adherent to the edges as a thin greyish membrane surrounding a red and oozing base (Fig. 3). Secondary infection soon supervened and covered the newly formed ulcer with a dirty-yellowish slough surrounded by a red areola (Figs. 4, 5). In spite of the fiery appearance of the ulcers, pain was never a prominent feature. The ulcers became confluent, but eventually healed with superficial scarring, which was particularly marked in the soft palate and faucial region (Fig. 6).

This cycle of papule, vesicle, rupture, secondary infection, and healing by scarring was repeated many times, and different stages of the cycle were present at the same time.

It was also noted that the superficial layers of apparently normal mucous membrane could easily be removed with a gauze swab. The detached membrane hung with an appearance very similar to strips of damp wallpaper (Fig. 7).

A tentative diagnosis of chronic benign pemphigus was made. The precise type of pemphigus could only be determined by the subsequent course of the disease.

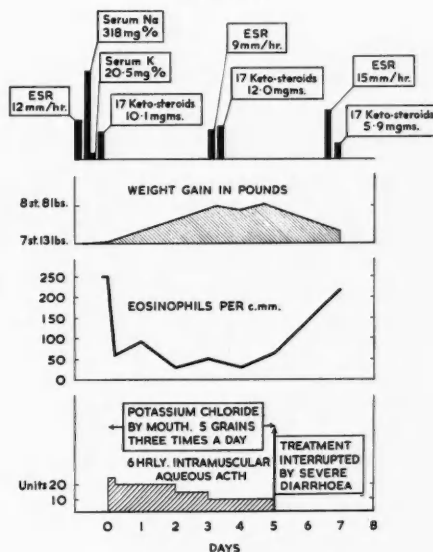
Treatment.—In view of the fact that all previous local and general treatments had been of no avail, and favourable reports of the use of ACTH and cortisone in the disease had been published (Aquilina and others, 1953; Rubin, 1951; Kierland, O'Leary, Brunsting, and Didcock, 1952; Copeman, 1953; McGehee and MacLean, 1954; Frazier and others, 1951; and Frazier, Lever, and Keuper, 1951), it was considered justifiable to treat the patient with these hormones, commencing with a course of ACTH.

On June 26, 1953, ACTH therapy was instituted and a positive Thorn test showed that the adrenal cortices were responding to the stimulation of the hormone. An aqueous solution of ACTH was given six-hourly. The details of the treatment and its control are given in Table II. The patient's appetite and sense of well-being improved considerably, and no fresh lesions in the mouth appeared. However, after five days, he had a severe bout of acute diarrhoea for which no cause could be found. All stools were negative for occult blood, and no pathogenic organisms could be found on culture. The hormone treatment was suspended owing to his poor general condition, the diarrhoea treated symptomatically, and he was discharged on July 31. Under this short course of ACTH some improvement had been achieved, and it was decided to give him a further and more prolonged trial at a later date.

He was re-admitted on Nov. 30. The condition of the oral mucosa was much the same as on his first visit, the throat was sore and the voice quite hoarse. In order to reduce the number of injections necessary, a slow release ACTH gel was used and given twice daily instead of four times daily as with the aqueous form. Four hours after the first injection, a satisfactory fall in the eosinophil count had not been achieved; however, after eight hours an adequate level was reached. This slow response to the substance in the gel form was presumably due to its retarded rate of release. The details of dosage and

control are given in Table III. The hoarseness of the voice and the sore throat gradually improved; the oral ulceration remained static. The ACTH dosage was increased until toxic signs were produced, mainly pitting oedema of the ankles, a rise in systolic and diastolic

Table II.



pressures, and the face became "moon-shaped". New hair appeared on the face, and the patient found it necessary to shave for the first time in ten years. In spite of the raised dosage level, new lesions appeared in the mouth. The dosage of ACTH was gradually tapered off, overlapped, and finally substituted by cortisone acetate given by mouth. This step was taken in view of the possibility that the endogenous production of the patient's own cortical steroids through the mediation of ACTH had achieved the maximum level of what might well be a limited output, owing to pre-existing atrophy of the adrenal gland. It was thought that the addition of a supply of exogenous cortical steroid in the form of cortisone might be worth a trial.

On Dec. 22 the patient was discharged with a month's supply of cortisone tablets.

On Jan. 19, 1954, he reported that his left eye felt "prickly and sore". On examination, the eye showed changes typical of conjunctival pemphigus. There was congestion of the lower fornix, a vesicle on the conjunctiva being observed, and there were several small areas of symblepharon, or adhesion of the palpebral and bulbar conjunctivæ of the lower lid (Fig. 8).

In view of the failure of the systemic cortisone materially to influence the course of the disease, treatment was discontinued. Two months later, the right eye became similarly affected; the left eye by this time showed marked obliteration of the fornices and a narrowing of the palpebral fissure. On the recommendation of

Mr. B. W. Rycroft, Consulting Ophthalmic Surgeon to Rooksdawn House, the eye condition was treated with nightly applications of 1 per cent cortisone ointment to the free margins of the lids, the object of this being to delay the formation of the scar tissue.

At the time of writing, June, 1954, his general condition remains fair, the oral condition is no worse and no better, and he is still able to eat well in spite of the continued ulceration of the mouth and pharynx.

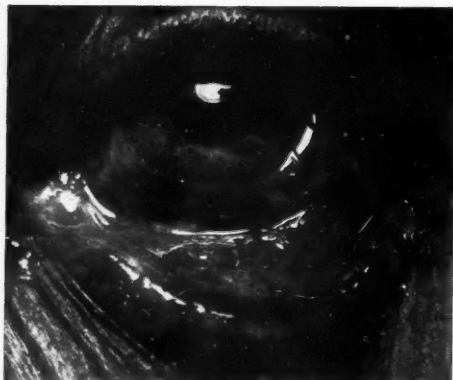


Fig. 8.—Injection of conjunctivæ and early syblepharon.

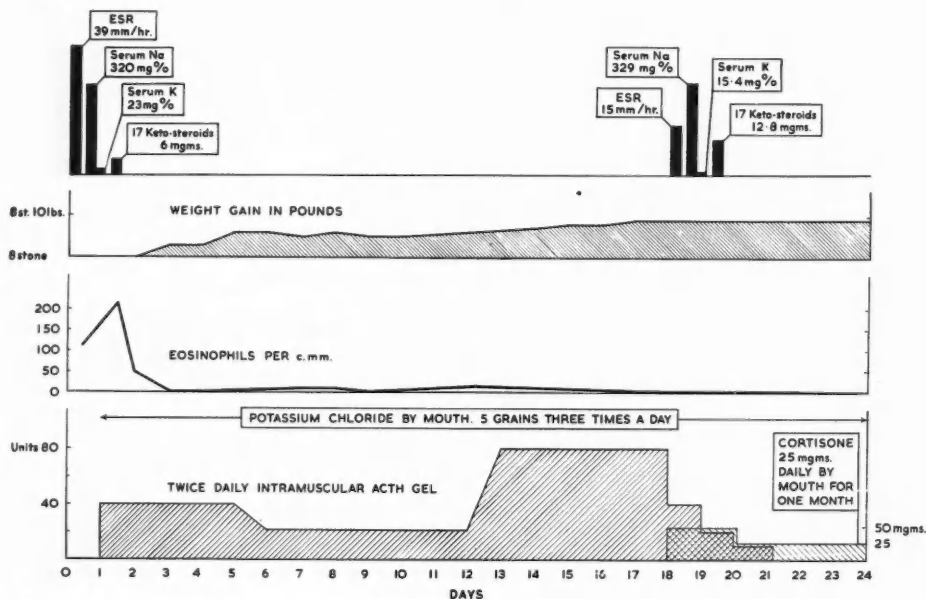
The eye condition has unfortunately deteriorated, and the topical application of the cortisone ointment has failed to check the progressive formation of scar tissue.

NOTE ON THE USE OF ACTH AND CORTISONE

Adrenocorticotrophic hormone, as the name implies, increases the patient's own endogenous supply of adrenal cortical steroids by direct stimulation and consequent hyperplasia of the gland. ACTH is therefore useless unless an intact gland capable of stimulation is present. Thorn in 1948, quoted by Copeman (1953), described a test for the assessment of adrenal cortical activity in which he defined that a 50 per cent or greater reduction of the circulating eosinophils should take place following a single injection of 25 mg. of ACTH, and this test should always be carried out prior to instituting a course of therapy. The hormone can only be administered parenterally.

Cortisone, on the other hand, is a form of substitution therapy comparable to the use of insulin in the treatment of diabetes, but

Table III.



unlike insulin can be administered by mouth. Prolonged use inhibits the natural formation of ACTH by the anterior pituitary gland and leads to atrophy of the adrenal cortex.

During treatment by either substance, fluids should be moderately restricted, salt severely restricted, and a high-protein diet given. In addition, not less than 1 g. of potassium chloride should be added to the diet each day.

Certain undesirable side-effects may manifest themselves during treatment. Fluid retention and fat deposition may lead to rounding of the features, with the production of a characteristic "moon face", together with pitting oedema of the ankles or sacral region. Prolonged treatment may lead to hirsutism, atrophic striae on the abdomen, and increase in pigmentation.

In view of the euphoria or excessive sense of well-being engendered by ACTH and cortisone, reduced sensitivity to painful stimuli, inhibition of the normal inflammatory response, and interference with carbohydrate metabolism, care must be exercised during the administration of these hormones lest one is exposed to the danger arising out of a false sense of security. The use of the hormones must not be allowed to become, as Copeman (1953) remarks, "the last refuge of the therapeutically destitute". Administration is therefore contra-indicated in the following conditions:—

1. Psychological or psychotic disorders.
2. Gastric or duodenal ulcer.
3. Acute infections or tuberculosis.
4. Diabetes.
5. Hypertension or renal disease.
6. Recent fractures. (Continued use may lead to osteoporosis and delay in healing.)

DISCUSSION

The case recorded is typical of pemphigus mucosæ affecting the buccal and pharyngeal mucous membranes and the conjunctivæ. On the evidence of the buccal ulceration, a presumptive diagnosis of chronic pemphigus was made. This was supported by the following facts:—

1. The long duration of the ulceration.

2. The involvement of the pharynx.
3. The healing of the ulcers by scarring.
4. Pain was not a prominent feature of the ulceration. (See Lebourg, 1947.)
5. Vesicles were observed.
6. Apparently normal epithelium could be easily detached by slight trauma.
7. The age of the patient.

The diagnosis of pemphigus was made quite certain by the subsequent appearance of the eye lesions, which placed the disease within the category of pemphigus mucosæ. The insidious appearance of symblepharon; the observation of a vesicle in the fornix; the slow onward progression of gradual shrinkage of the conjunctivæ, and the eosinophilic character of the conjunctival exudate are together diagnostic of the condition.

Differential Diagnosis.—There are a number of conditions which may show themselves in the mouth as superficial ulceration of the mucous membranes with or without preceding vesicle formation. Their differential diagnosis is made largely on the history and general signs of the particular disease.

Acute self-limiting lesions with traumatic, chemical, thermal, or bacterial causes are ruled out on the basis of duration. The ulcerations of pemphigus are commonly mistaken for Vincent's stomatitis, but the fœtor and pain associated with Vincent's infection are, however, quite characteristic.

The mucous patches of secondary syphilis can be excluded by the negative Wassermann reaction and the absence of generalized glandular enlargement.

Tuberculous ulceration must be considered. In the primary form, diagnosis can be confirmed by biopsy of an involved gland, and in the secondary form, lesions in the lungs are usually present.

A total and differential white-cell count usually excludes agranulocytosis and leukaemia.

The bullous variety of lichen planus may be distinguished by the associated presence of a white papular eruption on the mucosa (Cooke, 1954).

In sensitive subjects, buccal ulceration may follow taking drugs such as phenolphthalein, barbiturates, bromides, iodides, chloral hydrate,

and sulphonamides. Withholding the particular drug is followed by healing of the ulcers.

Contact allergy must be considered, and such substances as denture base materials, mouth-washes, lipstick, topical drugs, and antibiotics administered locally may cause vesicular and ulcerative reactions. Patch testing may give helpful information.

Herpetic or aphthous stomatitis usually presents as a tense vesicular eruption, either single or multiple, rapidly breaking down to give a circular punched-out ulcer with a dirty-yellow sunken base surrounded by a red areola. Compared with pemphigus, the ulcer is extremely painful. It heals completely without scarring in about a week or ten days, but is liable to recur in association with general ill health.

About 10 per cent of cases of dermatitis herpetiformis show mouth involvement. The skin signs are characteristically polymorphous, with alternating vesicular, papular, macular, nodular, and urticarial lesions. The attacks vary in duration from a few days to a few months and are recurrent. Vesiculation and ulceration of the lips and adjacent buccal mucosa accompanied by pyrexia occurs in human foot-and-mouth disease (epizootic stomatitis). The vesicles, unlike those in pemphigus, contain a turbid fluid and recovery usually occurs in one or two weeks from the onset. In some cases vesicles may be observed on the hands and between the toes.

The mucocutaneous-ocular syndromes must be considered in the differential diagnosis of oral ulceration (Robinson and McCrumb, 1950). Erythema multiforme exudativum (Moodie, 1950) presents in the mouth as a vesicular or bullous eruption going on to superficial ulceration. The skin lesion is a papular or vesiculo-bullous eruption surrounded by an erythematous halo, and is symmetrical and distributed over the front and back of the trunk, the extensor surfaces of the extremities, and backs of the hands, neck, and cheeks. Constitutional disturbance is usually mild, with a slight degree of fever, and headache and joint pains may be present. The disease usually runs a benign course of a

few weeks, but recurrences are frequent and fatalities have occurred.

The more acute variants of the disease, Stevens-Johnson syndrome (Stevens and Johnson, 1922), and ectodermosis erosiva pluriorificialis primarily affect the oral mucosa, conjunctiva, and genital mucosa and the constitutional disturbance is more marked. Erythema multiforme and its variants occur in children and young adults, whereas pemphigus occurs primarily in the elderly. The bullae of pemphigus arise from normal skin, whereas those in erythema multiforme are surrounded by erythematous haloes. The conjunctival exudate in erythema multiforme contains neutrophils, whereas that in pemphigus contains eosinophils.

Reiters' disease is marked by a non-specific urethritis, arthritis, and conjunctivitis. The mouth is sometimes involved in superficial ulceration. In contradistinction to pemphigus, the conjunctival exudate is neutrophilic in character.

Where a unilateral vesicular eruption is present, which is distributed along the course of a nerve, the possibility of herpes zoster should be considered.

Behcet's triple symptom-complex (Moodie, 1953) may give rise to considerable diagnostic difficulty in abortive cases. There is an aphthous type of ulceration in the mouth, and the genital lesions are usually limited to a few superficial ulcers on the scrotum or labia. The ocular lesions are most important, both from the diagnostic and prognostic points of view. The characteristic lesion is a phlebitis of the retinal veins, followed by iridocyclitis and hypopyon. The onset is usually insidious and commences before the age of 40. The disease runs a remittent course for fifteen to twenty years, during which time sight is usually lost.

Possible Factors in the Aetiology of Pemphigus.—Certain observations have been made which lend support to the view that adrenal cortical failure plays some part either directly or indirectly in the aetiology of the disease.

Talbott, Lever, and Consolazio (1940) called attention to the fact that in *acute* cases of pemphigus the electrolyte pattern was

almost identical to that observed in acute adrenal insufficiency as in an Addisonian crisis. There is a decrease of serum-sodium and serum-chloride, and an increase of potassium and non-protein nitrogen.

Cahn (1947) and Quinn (1948) also remark on the decreased sodium and increased potassium and also on the raised eosinophil count in cases of pemphigus.

Goldzieher (1945) points out that the biochemical findings are not unequivocal, and depend upon the stage of the disease. He performed a histological examination on the adrenals of 6 fatal cases of pemphigus. Regressive changes were found in all cases, compatible with the view that adrenal function is impaired in pemphigus. In his opinion, however, pemphigus is by no means a *primary* adrenal disease. On the contrary, he suggests that the causative agent of pemphigus produces damage to the adrenals as a complication of the cutaneous disease. This complication greatly influences symptomatology, course, and eventual outcome. Certain correlations can be drawn between evidence of impairment of adrenal function and the clinical picture of pemphigus. In adrenal cortical insufficiency, there is a decreased resistance to infection. There is also a marked increase in the permeability and fragility of the capillaries (Robson and Duthie, 1950), as a result of which plasma escapes into the tissue spaces, possibly contributing to the formation of vesicles and providing the mechanism for the production of Nikolsky's sign.

Associated Alopecia Universalis.—In the case under discussion it is interesting to speculate whether there might be any link between his generalized alopecia and the subsequent development of pemphigus.

It is a well-known fact that the commonest precipitating cause of alopecia universalis is mental shock or acute anxiety (Anderson, 1950). The fall from the ladder resulted in an acute mental shock, which in some way may have interfered with the hypothalamic control of the anterior pituitary gland. This is evidenced by the muscular wasting, premature senility, asthenia, and total alopecia. A lowered production of endogenous

adreno-corticotrophic hormone may have caused partial atrophy of the adrenal cortices, with a consequent fall in the output of cortical steroids and a resultant inhibition of the reaction of the body to both generalized and specific stress; the "target area" in this particular case being primarily ectodermal tissue, with particular reference to the mucous membranes and hair follicles.

From a perusal of reported cases it seems quite clear that pemphigus is a firm indication for the use of ACTH or cortisone. In the treatment of pemphigus mucosæ Frazier, Lever, and Keuper, (1951) reported 2 cures using these substances. McGehee and MacLean (1954) report 2 cases which would appear to fit into the category of pemphigus mucosæ which failed to respond to 200 mg. of cortisone daily. The patients, however, responded at all times to intramuscular ACTH gel or intravenous drip of aqueous ACTH, a daily dose of 20 mg. being adequate. Once the disease had been brought under control, no relapse occurred while the patients were receiving 20 mg. of ACTH three times a week.

In our case, neither the administration of cortisone nor of ACTH made any objective improvement to the oral ulceration or the condition of the conjunctivæ.

The successfully treated cases of pemphigus, which we have quoted from the literature, do not appear to have been complicated by any associated signs indicative of generalized pituitary dysfunction such as were observed in the case under discussion.

The inadequacy of the response in this instance may have been due to interference with the hypothalamic control of the pituitary, which has previously been postulated as a precipitating cause of the alopecia universalis.

In the present state of our knowledge it would appear that there are other factors, in addition to the cortical steroids, which play some part in the mediation of the body's specific reaction or adaptation to stress. Selye (1954, a) refers to the neutralizing action of the somatotrophic or "growth factor" fraction of the anterior pituitary gland upon the glucocorticoid fraction of the adrenal cortex which normally exerts an anti-inflammatory or

inhibitory influence upon the healing of wounds. In a further article (Selye, 1954, b) reference is made to an, as yet unknown "antiphlogistic-corticoid-conditioning factor" which mediates the action of the glucocorticoid fraction in a similar manner.

This latter factor, the effect of which appears to take the form of a peripheral synergism with the adrenal corticoids at the site of the stress reaction, is not a product of adrenal cortical activity. It is possible that its efficiency may depend in part, or entirely, upon the integrity of the hypothalamic control of a normal pituitary-adrenal axis, and this influence may have been defective in the case which has been described.

SUMMARY

A short review of the clinical varieties of pemphigus has been given, with particular reference to involvement of the mucous membranes.

A case of pemphigus of the mucous membranes associated with alopecia universalis, which subsequently manifested involvement of the conjunctivæ, is described in detail. Some aspects of treatment with ACTH and cortisone are discussed.

The differential diagnosis of allied conditions presenting similar clinical features is considered and some reasons which may possibly be responsible for the failure of the condition to respond in this instance are suggested.

Acknowledgements.—The authors would like to thank Mr. and Mrs. R. K. P. Miller, Dental Surgeons, of Sherborne, for kindly referring this case to us.

Our grateful thanks are due to Capt. H. Sibson Drury for the preparation of the graphs, and to Mr. E. Ferrill, of the Department of Medical Photography, Rookdown House, for the illustrations.

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Praktische Parodontose-prophylaxe

Adequate appreciation of the signs and symptoms of health as a precursor to study of the development of pathological lesions of the periodontal tissues is stressed. Practical preventive measures must strive primarily to eliminate local irritants.

1. By securing occlusal equilibration during dental development, i.e., early orthodontic treatment and avoidance of extractions; and also in the adult dentition, i.e., selective grinding and prosthetic rehabilitation.

2. By stimulating proper mastication and avoiding bad habits, mouth-breathing, lip and tongue biting, and bruxism in order to promote self-cleansing and natural massage of the periodontal structures.

3. By maintaining a meticulous state of oral hygiene.

4. By performing good dentistry.—BAUME, L. J. (1954), *Parodontologie*, **8**, 143.

THE PROCEEDINGS OF THE BRITISH SOCIETY OF PERIODONTOLOGY

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PSYCHOSOMATIC MEDICINE

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ONE of the problems that bedevils psychiatry is language—the use and meaning of words. Communication either verbal or non-verbal is an absolute essential in our work with patients, and in our reports to fellow practitioners. If that communication is poor or faulty, we may never understand our patients, or they us. Similarly, if our lectures, or papers are couched in language which is unintelligible to the audience, then unfortunate opinions are generated. Psychiatry has had to develop a terminology of its own, which by virtue of its relation to mental events, is often obscure or difficult to master. These linguistic tribulations have contributed enormously to the relative unpopularity of the psychiatrist with his colleague—on the one hand there is a semantic confusion, and on the other, as often as not abysmal ignorance, so that the inevitable clash occurs. I hope to avoid these difficulties as far as possible, and to use simple, non-technical language.

In fact, the term “psychosomatic medicine” has been strongly criticized. The more experienced we become, the more we realize the indivisible unity of the organism. There is really no such thing as a mind and a body. However, such has been the development of medicine that separate methodologies have grown up to study mental and physical phenomena. We seem to have difficulty in dealing with total reactions—and of course an important factor has been that the investigator in this field is of necessity a living being. At the moment, therefore, we are still under the necessity of preserving this dichotomy, and

psychosomatic medicine, by and large, is concerned with the study of the influences of the mind on the body. These influences have, of course, been known for centuries, and are a matter of common observation. Anger, fear, love, or embarrassment, have all their physical concomitants. The old humoral pathology indeed gave great prominence to the effect of emotions on disease—but these effects were general rather than specific. The most important observation, however, was that it was the emotions, the feelings, which were connected with bodily manifestations rather than other qualities of the mind, such as thinking or learning. This concept of the general effect of emotions on the body persisted until about twenty or thirty years ago. Since then, however, with the advance of psychiatry into the field of general medicine, there has been a remarkable change, and it is with this that we are concerned.

It slowly became apparent that there were certain types of disorder where the influence of psychological factors was of a specific, rather than a general nature, and in which emotional disturbances alone could result in an outbreak of bodily disorder. In these diseases a convincing physical aetiology had never been adequately established, none of Koch's postulates had been fulfilled, in fact they were diseases of largely unknown origin, of uncertain cause, and of non-specific treatment. And of course, in this lies a great danger for psychiatry, for it is comparatively easy to find psychological disturbances in most people. The observation, however, that the intervention of

a psychiatrist might rapidly modify the course of these diseases where all else had failed, added further weight to the view that these were disorders where a psychological factor was of pre-eminent importance. Research went rapidly ahead, particularly in America, and a journal *Psychosomatic Medicine* was launched on a successful career in 1939. In this country and in Europe, however, the resistances have been somewhat greater, but to-day there is a steadily growing body of informed opinion—somewhat more conservative than in America, but nonetheless, with a basically similar approach.

What are these diseases? For before we can understand the problems involved, it is necessary to know what these problems are. Amongst the more important are asthma, peptic ulcer, ulcerative colitis, eczema, hypertension, and rheumatoid arthritis. In all of these conditions a psychological factor is alleged to be of importance in the development and course of the disorder. Perhaps it will serve our purpose best if we select one condition for a detailed discussion, and then consider the general problems posed by these conditions. Asthma is a subject on which I have some experience—for the last six years I have been studying a group of asthmatics, by now 140 of them. Asthma is, as you know, a Greek word meaning "difficult breathing". It has come, however, to mean paroxysmal attacks of dyspnoea, mainly expiratory in nature, with wheezing. Clearly it is a symptom which can have many causes, and we speak of renal, cardiac, and bronchial asthma. I am only concerned with bronchial asthma—that is attacks of paroxysmal dyspnoea, mainly expiratory in nature with wheezing, occurring in the absence of any demonstrable organic disease. Asthma is a common disorder, affecting between 1 and 2 per cent of the population, and occurring at all periods of life. An odd fact is that before the age of 14, roughly twice as many boys suffer from asthma as girls, whereas after 14 the position is reversed. There is a large constitutional factor, for there is a definite hereditary influence, and two thirds of the patients give a family history of asthma, hay fever, or

eczema. The peculiar features of this constitution are what we call "allergic" manifestations—a particular sensitivity of the organism to certain external substances such as pollens, moulds, or a thousand and one other different substances. The disorder is a phasic one, attacks occurring at times in bouts, whilst at other times there are free intervals, may be of many years. Between attacks, as often as not, no abnormal signs may be found in the chest.

Since the discovery of anaphylaxis by Richet at the beginning of the century, an enormous volume of work has been devoted to the allergic aspects of asthma, and yet, with all this, any experienced physician will acknowledge that allergy is by no means the whole story. The diagnostic skin tests have proved very unsatisfactory, whilst desensitization has so unpredictable an effect as to deny any scientific analysis.

These facts are, as it were, the stage setting into which the psychiatrist, rather like Bottom in the *Midsummer Night's Dream*, enters. He is the buffoon, the man who knows no medicine, to many of his colleagues. But it has always been recognized that "a nervous element" does enter somewhere into the problem of asthma, and so, rather late in the day, the psychiatrist is called in, and like Bottom's play, his work is carried out in a somewhat isolated and unaccepted manner. I think it is necessary to put forward these facts, for they apply to the whole field of psychosomatic medicine in some degree.

Now how does the psychiatrist get to work? The asthmatic attack may be regarded as resulting from a stimulus of some kind or other—for instance, a cloud of grass pollens impinge upon an asthmatic patient may immediately provoke wheezing. If we regard our patients in a total way, we see them living both an inner and an outer life. The stimuli the world provides—dust, pollens, fumes, bacteria—come from the outside; the psychiatrist is concerned with what comes from inside, endocrine, nervous, or psychological factors for instance. So we develop the concept of an asthmatic attack resulting from stimuli which arise from either within or without, disturbing

the equilibrium of the organism. In other words what is called a "disturbed homeostasis".

The psychiatrist now attempts to isolate those mental stimuli which are capable of provoking an asthmatic attack. This is done in the first place chiefly by interviewing techniques. Interviews focused on a variety of topics and lasting 50 minutes, with a minimal interference by the psychiatrist, and numbering up to 150 in all, are recorded. From the mass of material thus obtained, an attempt is made to isolate certain patterns of reaction and the stimuli which evoke them.

In asthma we have found a variety of emotional disturbances which can be associated with attacks. First, any sudden, intense emotion may precipitate an attack. Rage, fear, sexual feelings are commonly noted. A case I have quoted previously is a dramatic example.

A man of 50, had been previously healthy, apart from a recurrent winter cough. His son of 18 was arrested in May, 1950, for assaulting a courting couple. The boy had been one of a gang of louts spying on courting couples, and when one of the lovers, goaded by these boys, told them to clear off, the gang forthwith set on him and beat him up. They were duly arrested and tried at the Old Bailey. Our patient was very upset by this and could not sleep. One night he went to his son's room, in a murderous rage, with the intention of strangling him, but was in fact unable to even upbraid the boy. The son was sentenced at the Old Bailey to eighteen months' imprisonment, and the patient developed his first attack of asthma in the Court whilst the Judge was sentencing his son.

Sexual feelings are well known—in their relationship to asthma. One woman developed an attack every time her husband got into her bed, but as he paid no attention to her, and read until he went to sleep, her feelings were, in fact, very mixed.

Secondly, we find that the inhibition of an emotion is commonly associated with asthma. Here anger is by far the most frequent emotion. The patient is unable to express his feelings in the ordinary way, instead an attack

develops. Asthmatics are said to have a basic difficulty in confiding in people, and that once they are able to confess to the psychiatrist what has been disturbing them, the attack will dissipate itself.

Now of course the problem arises as to why asthmatic attacks occur in these two situations—after all, everyone has to inhibit his feelings at times, and everyone has experienced sudden acute emotions. We must try to trace the historical developments in the patient's life by which he has developed a specific mode of reaction to what are, after all, commonplace happenings. At this stage the problems become more difficult, largely because psychiatry is as yet a very inexact science. There are different schools presenting their own theories of mental functioning, and in any case we are dealing with things which are largely intangible, and are lost in the past.

How are these reactions built up—why does the asthmatic inhibit his emotions? There are several ways of looking at this. First, as we have seen, the asthmatic is endowed with a particular constitution and heredity. He is more sensitive than others to particular stimuli, so that his emotional lability has come to be associated with attacks of asthma. Accordingly, as a defence, he tends to inhibit his feelings and yet the asthmatic attacks still occur in their setting of emotional disturbance, for it is not an adequate defence.

A second approach, however, analyses these facts in greater detail. The asthmatic attack is regarded as an inhibited cry of longing and of rage for the mother. The baby's first source of love is the mother; she feeds and nurses the baby, which sleeps if it is contented. When it is hungry or discontented it cries. If by any chance the supply of love—which is linked with food in infancy—is insufficient, the crying will occur more frequently and become linked by association, so that later frustration will become associated with an equivalent of crying—to wit, an asthmatic attack. Feelings of rage toward the mother must necessarily be inhibited; what can a child do against a powerful adult? And so in general an inhibition of feelings results, yet linked at the same time

with a longing to confide, and for love and affection. The key figure is the mother. Therapy is devoted to exploring the disturbed mother-child relationship, and allowing the patient to express his or her hostility toward this key figure.

A third theory, using Pavlov's formulation, regards the asthmatic attack as a conditioned response. Pavlov had shown how various bodily reactions involving the autonomic nervous system could be "conditioned", that is, aroused by stimuli of quite an "unnatural" variety—salivation to the sound of a bell, instead of to a piece of meat, for instance. Once set up, the conditioned response remained comparatively stable. Asthmatic attacks, for instance, have been produced in guinea-pigs by conditioning techniques.

Clearly, whatever the theory, a large amount of experimental work is necessary in the study of asthma. New techniques of measurement will have to be developed, in order to objectify these observations by psychiatrists. The encouraging fact is that asthmatics do respond in many cases to psychological treatment when all else has failed, so that our work is not lacking in human satisfaction.

The story I have briefly sketched could be repeated with regard to the other disorders I have mentioned. Each would present its own problems, but it will probably be more rewarding to consider what are the general problems. These are:—

1. The problem of specificity—that is, why a particular organ system is selected as the outlet for emotional disturbance;
2. The problem of personality and its relationship to these disorders; and
3. The problems of aetiology—particularly of psychogenesis.

The problem of specificity of course is not only a problem for psychosomatic medicine, it is a problem for medicine in general. Why do certain people get certain diseases? Why should this catastrophe befall this particular person? These are questions which must always concern the thoughtful physician. With infective disorders it is relatively easy to arrive at fairly clear-cut conclusions, but even in many infective conditions, for example the

virus diseases and poliomyelitis in particular, there are many puzzling and hidden mysteries. In the psychosomatic disorders one of our chief problems is to account for the remarkable specificity so often seen. In peptic ulcer, either the duodenum or the stomach are most commonly involved, but we all know that there are certain predilective sites for the ulcers to appear, there are different types of ulcers, and different rates of progression of the ulcer. Many years ago certain organs were endowed with certain emotions—and our everyday language is full of what we call body language—"I'm fed up", "You make me sick", "My heart says I love you", and so on. Psychiatrists went through a stage, in fact some are still at this stage, when the expression "organ neurosis" was the answer. The implication here was that the neurosis, instead of being expressed in symptoms of anxiety or of hysteria, or by acting out in delinquent behaviour, for example, is expressed in a disturbed function of a particular organ. To explain this further the idea of "organ inferiority" was brought in—the weak spot, as it were, being the focus on which the disturbance played.

These concepts, of course, offend against many of the facts of medicine and physiology. American philosophy is a very rationalistic and pragmatic philosophy, and so it was natural that a wave of research should arise in reaction to these views. Now the specificity was seen, as the result of a more general reaction, the famous experiments by Wolf and Wolff on Tom, the man with the gastric fistula, being models of psychosomatic research. Certain specific emotions were associated with specific changes in Tom's stomach. These authors consider that psychosomatic disorders represent a biological defence, largely inherited, but also affected by cultural factors. The organism reacts to a threatening situation, or symbol, by a defensive posture. With the hay-fever sufferer for instance, the hay-fever represents an attempt at shutting out and washing away the noxious pollen. These defence reactions were largely general reactions originally, but have become fragmented as the organism has matured.

Lastly, among American psycho-analysts there is the theory of so-called "physiologic infantilism"—that the workings of the body in infancy and childhood are very different from those in adult life, and that there is a tendency, in psychosomatic disorders, to discharge conflicts in those organs where the physiological lability of immaturity has been retained, or been re-established.

The next hotly debated point is the question of the relationship of personality to psychosomatic disorder. Typology, the description of certain types of character, can be fascinating, and we all tend to indulge in it. Physicians have taught for years that certain types of person are liable to develop certain diseases, the energetic, active, striving business man or doctor has a coronary, the lean and hungry bus driver gets a duodenal ulcer, and so on. It became fashionable, and still is, to describe various personality types as liable to develop a psychosomatic disorder. Thus ulcerative colitis was found in obsessional, socially inadequate, inhibited people, who were abnormally dependent on others for supplies of self-esteem. The asthmatic child was described as having such a clear-cut personality that it could be described as the "asthma-eczema-prurigo personality". The trouble is that I believe all this is quite untrue, for when one uses scientific methods of assessing personality, then in asthma, for instance, there is quite a normal spectrum. I have seen all types of person with asthma. And yet this is one of the pitfalls into which so many observers fall—I shall refer to this later when I speak of some psychosomatic problems of dentistry.

Lastly, the pathogenesis of these disorders is highly problematical. Given a relationship between emotional disturbance and bodily dysfunction, we have to explain how one becomes the other, although, as I have said before, we must always remember that this attitude is a dualistic one. At the moment interest is focused on two main systems, the autonomic nervous system and the endocrine system. You will remember that the autonomic nervous system is concerned with the control of smooth muscle, glands, and blood vessels, and is largely outside volition. It is

the mediator of emotion—when we feel embarrassed we blush, that is the blood-vessels in the facial skin dilate. Basically its reactions prepare us for "fight or flight". Linked up with the autonomic nervous system are the endocrines, for they too have a large share in emotional reactions. Adrenaline, for instance, is poured into the blood when we are angry; a sudden shock may cause an abrupt cessation of the menses. Recently the activity of the adrenal cortex and of the adrenocorticotrophic hormones has been under particular study. Both of these systems are concerned with the *milieu intérieure*—with the regulation of the stability of the body, with what I have called "homeostasis". They are the pathways through which impulses pass from the brain to the body, and it is not difficult to see their potential importance in psychosomatic disorders, which, by and large, are disorders affecting the "involuntary" parts of the organism.

I hope this brief survey of the general theory of psychosomatic medicine will help you to follow me in my incursion into your own field. And here I must state at the outset that I have little personal experience, for, on the whole, dental disorders are not referred to the psychiatrist. I have seen a number of patients where tooth extraction or mouth operations have precipitated psychosis or neurosis, and of course teeth very commonly occur in dreams. But the so-called dental psychosomatic disorders do not come into my life. The Maudsley Hospital is the only post-graduate teaching hospital for psychiatry in the Commonwealth, and I do not think we have had referred to us a single example of the disorders on which I have chosen to speak. I refer to acute necrotizing gingivitis or Vincent's disease, chronic periodontitis, and periodontosis. Here are three conditions where the aetiology is obscure, and where workers in the field are dissatisfied with the present situation. Bacterial, nutritional, and mechanical factors have all been involved at one time or another, whilst recently interest has become focused on the psychosomatic status of patients with these conditions. I must point out that this is nearly always the

case in disorders the aetiology of which has proved obscure. The psychiatrist is called in and he generally, and I think this is unfortunate, finds some psychiatric abnormality. It is easy to see that emotional changes may produce changes in the blood-vessels of the gums, in the pH of the saliva, and in the body's resistance to bacteria—and certainly these are all valid facts. The problem, however, as you have seen, is why particular persons develop particular disorders, for all of us may develop the above-mentioned changes under emotional stress.

Now in America psycho-analytic concepts hold the field at the moment, and so it is suggested that these conditions arise in people of a certain type—what is called the “oral-dependent type”. That is, people who have problems relating to the mouth—problems of eating, loving, and hating. The cases of acute necrotizing gingivitis developed the disorder in situations where acute anxiety had arisen from a life situation involving conflict about dependency and sexual needs. Local factors and oral habits were at a minimum.

The chronic periodontitis group had a background of chronic conflict. Marital troubles were frequent, and the patients had a long-standing need for dependency. Bruxism was frequent in the periodontitis group and there was less neuroticism and less destructive oral habits.

Now in all the papers which I have studied for the purpose of this section of my talk, there

have been no adequate controls. In fact this is the unfortunate situation throughout the literature on these psychosomatic afflictions. And without adequate controls scientific work in medicine is practically impossible. Marital disorder, neurosis, oral dependency, are all unfortunately extremely common. Before any causal relationship can be established the disorder in question must be shown to be statistically related to one or other of these factors, otherwise we are dealing with pure supposition. This is particularly difficult in chronic disorders; for acute necrotizing gingivitis the problem is easier. At the moment, such is the uncertainty in this field, that unless sound statistically controlled investigations are carried out, little of value will emerge.

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A CASE OF MONILIAL INFECTION IN A HEALTHY ADULT

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ORAL thrush or moniliasis is found most commonly in infants, young children, and the aged. In infants and young children the infection can be transmitted by infected nipples and by the clothes of nursing staff (Burket, 1946). Woodruff and Hesseltine (1938) stated that babies whose mothers suffer from vaginal moniliasis are thirty-five times more liable to develop thrush than those of non-infected

mothers, but Waters and Cartwright (1939) found no such relationship. The consensus of opinion is that in adults it may occur in those debilitated or diabetic, but is rarely found in healthy persons. (Burket, 1946; Stones, 1948; Glickman, 1953.)

Simpson (1951) reported 2 cases where there was a possible relationship between trauma and the onset of the lesion. In both cases the

patients were wearing full dentures and a slightly atypical lesion occurred in the cheek along the line of the occlusal plane. Both patients, one a male aged 56, the other a female aged 42, were otherwise in good health.



Fig. 1.—The white patches in the left retromolar area and on the adjacent buccal mucosa.

Hogan (1951) also reported a case of moniliasis in a healthy male aged 35, with a fungus infection on the fingers of both hands which had persisted for ten years. This patient presented with a fairly extensive lesion over the soft palate and dysphagia.

There are a limited number of cases reported where oral thrush has appeared following the use of antibiotics administered by the systemic route. Marcovici (1946) described 4 cases of oral thrush following systemic penicillin for general infective conditions. Lighterman (1951) 3 cases in debilitated patients being treated with aureomycin, and Bartels (1953) a single case of thrush following prolonged systemic penicillin and terramycin therapy. Lighterman suggested that a vitamin-B deficiency favoured a growth of *Monilia albicans* (*Candida albicans*), and that this type of avitaminosis is associated with aureomycin therapy.

The *Lancet* in its Annotations (1951) cautions practitioners about the danger of topical penicillin upsetting the balance of the oral flora, thus allowing *Candida albicans* to realize its potential pathogenicity.

Both Glickman (1953) and Lucas and Kramer (1954) subscribe to the view, but the

last-named have also pointed out that fungi may disappear during antibiotic therapy.

Candida albicans is found in the normal bacterial flora of the mouth and as such can contaminate and complicate root-canal



Fig. 2.—A Gram-stained smear showing yeast-like organisms in both the blastospore and septate hyphae forms.

therapy. It is a Gram-positive yeast, spherical in shape, about 5μ in diameter, and can show the presence of buds.

A direct smear examination may show the organisms, but they can be quite easily cultured and isolated from a blood-agar plate, whereupon their identification is unmistakable. The fungi, of which monilia is one, are not sensitive to penicillin (Bulleid and Shuttleworth, 1949; Lucas and Kramer, 1954).

CASE REPORT

A healthy young male, aged 22, attended in July, 1954, for extraction of 8j. A day later he returned with a Vincent's ulceration around the socket of this tooth and around 76j. He was given 600,000 units of procaine penicillin and 200,000 units of crystalline penicillin intramuscularly, and was not seen again until Oct. 13, when he returned complaining of bleeding gums, and a diagnosis of acute ulceration of the Vincent's type in the left mandibular molar region was made. This was treated by putting him on penicillin lozenges for 48 hours, each lozenge containing 500 units of penicillin, followed by scaling of the teeth and instruction in the use of wood points interdental. During this treatment the 8j was extracted. At the beginning of November his oral condition was considered satisfactory and he was discharged, requiring no further dental treatment. On

Nov. 30, however, he again reported complaining of pain in the ⁸ region. Examination showed typical ulceration of the Vincent's type confined to the gingiva distal to the molar. The clinical diagnosis was confirmed by a direct smear examination, which showed a profusion of *B. fusiformis* and *T. vincenti*.

In addition there were two small, milky-white patches having the appearance of curdled cream, one in the left retromolar area and the other on the adjacent buccal mucosa about which the patient was unaware (Fig. 1). Removal of the patches was quite difficult and left raw bleeding surfaces.

The removed patches were crushed on a slide and stained by Gram's method. Examination showed epithelial cells containing Gram-positive yeast-like organisms, probably *Candida albicans* and Gram-negative cocci (Fig. 2). The monilia were seen in both their septate hyphae form and as budding blastospores. Some remnants of the patches were cultured for 12 hours on a nutrient blood-agar plate and an examination of the growth again showed the presence of Gram-positive yeast-like organisms and *Micrococcus catarrhalis*. Wassermann and Kahn tests were negative.

The patient was again given penicillin lozenges for 48 hours, 25 tablets, containing 500 units each, being consumed in that time. This was followed by one application of chromic acid and hydrogen peroxide to the maxillary tuberosity region. Four days later the ⁸ was extracted, there being no complications during the healing period.

Ten months before the patient presented at this hospital he had had five courses of systemic penicillin over a period of six months, each course lasting three days. These were for the removal of cysts in the ear, and other than this he has had no antibiotic therapy.

Comment.—This case is presented because it appears to be rare for a classical type of moniliasis to occur in a healthy adult. The reason for its appearance would seem to be uncertain; it may have been due to a localized lowering of tissue resistance in the oral cavity due to the concomitant presence of the Vincent's infection, even though the lesions were on opposite sides of the mouth. Possibly

the intermittent use of antibiotics over a period of eighteen months was a predisposing factor, or even the previous Vincent's infection in this area seven weeks earlier. It was anticipated that the monilia would flourish under the influence of local penicillin in the saliva, but in fact the clinical signs disappeared without any treatment at all.

SUMMARY

A case of moniliasis concurrent with a localized Vincent's infection in a young healthy adult is reported.

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Observations on the Composition and Metabolism of Normal and Inflamed Gingivæ

An examination by histomedical methods of gingival tissue from 56 individuals, 8 of whom had clinically normal gingiva, 7 a slight marginal gingivitis, and 41 with inflammation varying from a gingivitis to periodontitis, was made in order to illustrate the presence of glycogen, glycoprotein, mucopolysaccharide, keratin, alkaline phosphatase, and nucleic acids.

Glycogen was found in the marginal epithelium of the inflamed gingivæ, and an hypothesis advanced that this resulted from excess glucose produced in the subjacent inflamed tissue.

Glycoprotein of the ground substance was diminished in zones of inflammation.

Keratinization of the crevicular epithelium was not observed in any of the cases, and all crevicular epithelium was infiltrated by leucocytes.—DEWAR, M. R. (1955), *J. Periodont.*, **26**, 29.

SOCIETY NOTES**NORTH STAFFORDSHIRE SOCIETY OF DENTAL SURGEONS**

THE Annual General Meeting of the North Staffordshire Society of Dental Surgeons was held at the North Stafford Hotel, Stoke-on-Trent, on April 21, 1955. The President, Mr. J. S. Hilton, was in the chair, and 18 members were present.

The minutes of the last Annual General Meeting were read and confirmed.

The Hon. Treasurer's Report, which showed the Society's funds to be in a sound condition, was read and adopted.

The Hon. Secretary's Report, which recorded a successful 1954-55 year, was read and adopted.

The following Officers were elected for the year 1955-56:

President: Mr. M. Wain.

President-elect: Mr. A. S. Donaldson.

Hon. Treasurer: Mr. R. J. Skae.

Hon. Secretary: Mr. R. Myers.

Election of two members to the Council:

Mr. J. H. D. Myatt and Mr. G. Martin were elected to replace Mr. R. C. Smart and Mr. K. Adams (retiring members).

Hon. Auditor: Mr. J. H. D. Myatt.

DENTAL EXHIBITION

By permission of the University Court, Dr. J. Menzies Campbell will exhibit in the Hunterian Museum (the University, Gilmorehill, Glasgow) a comprehensive selection of his early dental collections, from July 2 to July 9. The Museum is open daily, without charge, from 10 a.m. till 5 p.m.; Saturdays, 10 a.m. till noon.

Among the numerous items which will be on view are:—

British and American books and pamphlets, eighteenth and nineteenth centuries.

First and Second Journals published in Great Britain, 1843-1845.

Album of 633 advertisements, 1711-1850.

Chevalier Ruspini's Warrant and Recording of Arms, 1791.

Membership Certificate, first national society 1840.

Instruments for extracting, filling, and scraping teeth, sixteenth to nineteenth centuries.

Artificial dentures, bone, ivory, and de Chémant's, eighteenth and early nineteenth centuries.

Tooth-brush sets, Toothdrawers' tokens and medals, eighteenth century.

All exhibits will be fully described.

NATIONAL HEALTH SERVICE NOTES**GENERAL DENTAL SERVICES****Conditions with respect to Materials**

The use of Bynalloy, a chrome cobalt alloy, has been approved by the Minister. The Scale of Fees at present contains no specific fee for denture bases of this material and practitioners using it should therefore submit claims under Item 25 of the Scale of Fees.

Retention of Records

THE Minister intends at suitable opportunity to amend paragraph 5 of the Terms of Service (Part I of the First Schedule to S.I. 1954 No. 742) to place limits on the periods within which dentists can be required to produce

records to the Dental Estimates Board, the Council, Local Dental Committees and Dental Officers. These periods will be:

(i) for treatment on estimates requiring the Board's prior approval, four years after the end of the financial year in which payment was made;

(ii) for other treatment, two years after the end of the financial year in which payment was made.

Pending the amendment of the Regulations the Minister has asked the Dental Estimates Board, Councils, Local Dental Committees and his Dental Officers to refrain from asking dentists to produce records beyond these

Disposal of Documents which have lost their Value

<i>Number and class of documents</i>	<i>Period of time which documents may be destroyed</i>
1. Forms AS/DEB, AS/DEB/B, AS/DEB/C, AS/DEB/D, and related Dental letter.	Forthwith
2. Forms D.E.1 and D.E.1 (Rev.).	Two years after the end of the financial year to which the form relates.
3. Forms E.C.17 (Revised) and E.C.17 (Rev. 2)	Ditto
(a) Middle section (held by E.Cs.).	Four years after the end of the financial year to which the form relates.
(b) Top section (held by D.E.B.)	
(i) where the treatment required prior approval by the Board.	
(ii) Other cases.	Two years after the end of the financial year to which the form relates.
4. Forms E.C.55.	Ditto
5. Forms E.C.60.	Ditto

periods. Although dentists will not be asked to produce records beyond the specified periods they may well find it desirable to retain their record cards for their own use.

It will be noted that the Dental Record (Form E.C. 25) is not included in the schedule,

as it is for dentists to decide how long they should retain these records. In this connexion the Minister intends at a suitable opportunity to amend the terms of service to place limits on the time within which a dentist may be required to produce records.

CENTRAL HEALTH SERVICES COUNCIL AND STANDING ADVISORY COMMITTEES

Membership Changes

THE Minister of Health has made the following appointments and re-appointments to the Central Health Services Council and Standing Advisory Committees for the period ending March 31, 1958 (an asterisk denotes a new member).

Central Health Services Council:—

Dental Practitioner: *T. Hindle, Esq. (Blackburn).

Standing Dental Advisory Committee:—

*M. Beverley Burton, Esq., L.D.S. R.C.S. (Abergavenny, Wales).

T. Hindle, Esq. (Blackburn).

Professor M. A. Rushton, M.D., F.D.S. R.C.S. (London).

*R. G. Swiss, Esq., L.D.S. R.C.S. (Harrow, Middlesex).

Professor F. C. Wilkinson, M.D., D.D.Sc., M.Sc., B.D.S., F.D.S. R.C.S. (London).

HEALTH SERVICES IN NORTHERN IRELAND

The Tanner Committee's Finding

IMPORTANT recommendations concerning the health services in Northern Ireland are contained in the report, recently published, of the Tanner Committee. The Committee, which was appointed by the Minister of Health and Local Government almost a year ago to consider and advise on criticisms and suggestions made by members of both Houses of Parliament, finds that "although deficiencies still exist in the health services in Northern Ireland, the general picture is of vigorous and continuing growth".

Regarding the general dental services the report refutes suggestions that there is a shortage of dentists in general practice and that the imposition of charges is undermining the promotion of conservative dentistry and thus defeating one of the main objects of the Act. It agrees that there is a shortage of dental students, which may be attributable partly to the inadequacy of present facilities for

teaching purposes, but points out that the shortage is not peculiar to Northern Ireland and that a Committee has been appointed in Great Britain to consider the reasons for it.

The Committee analyses in some detail complaints from the dental profession of delay in the approval of dental estimates and unduly restrictive interpretation by the Health Services Board of regulations governing general dental practice, and concludes that: "the discontent voiced by the profession with

the Board's methods of administration springs mainly from a failure to utilise the machinery of consultation which alone would lead to good mutual understanding. We trust that, once the dental profession in Northern Ireland has accustomed itself to a process of regular consultation with the Board, relations of mutual respect and confidence will be established, and that it will then be possible to resolve most of the difficulties which are said to exist at present."

The Effect of Sugar Supplements on Dental Caries in Children

AN undoubted reduction in the caries incidence amongst children in this country occurred during the war years. Some have attributed this to the reduced overall sugar intake which took place, and in order to study this further the Medical Research Council has carried out an investigation, the results of which have just been published.

Children were given additional sugar in their diets for periods up to two years, and regular six-monthly dental inspections were made. The investigation was conducted in the London area, in Sheffield, and in Liverpool on children living in residential houses, as three separate groups, but this does not appear to affect the final results. Both the Liverpool and Sheffield studies were carried out on children between the ages of 4 and 14 years, whilst the London study dealt with children from 2 to 4 years. The basal diets at the institutions were found to be balanced and adequate and it was decided to add 22 oz. of sugar a week to the diets of the Liverpool and Sheffield children (age 4 to 14) and 11 oz. a week to the diets of the London children (age 2 to 4), bringing the total sugar consumption of each child up to the calculated pre-war average for children of these ages. A control group with no additional sugar was maintained in each group.

The individual studies produced conflicting results amongst various age groups and types of teeth, but when the results are combined to produce greater numbers, no significant findings appear either way. To quote from the conclusions: "The results of the investigation

demonstrate that relatively great differences in the total sugar content of the diets of children in institutions had no significant effect on the initiation or spread of dental caries in the periods of one to two years". The apparent discrepancies which appear are regarded by the authors as being due to chance variations due to small numbers when the main groups of children are split into sub-groups.

The report ends: "In conclusion it may be said that, whilst this investigation does not prove that the sugar content of the diet, *however distributed and however eaten*, never affects the teeth, it certainly points to the practical conclusion that provided a child is fed on a diet as good as that of the average children's residential institutions in England, a substantial increase in the amount of sugar in the diet will not affect the child's liability to dental caries within a period of two years".

The investigation was purposely simple in order that it would succeed, and the conclusions drawn are limited to the conditions of the experiment. Only two small criticisms present themselves: One is that the method of assessing the average caries figure in the London study is different from the other two, and the other that it is difficult to imagine how two statistically significant results can disagree because of chance variation due to small numbers as the authors suggest—*Med. Res. Council Spec. Rep. Ser. No. 288.*

Corrigendum

May issue, p. 299, Fig. 3. Caption should read: Case 3, father of Case 2. Note lip seal.

BOOK REVIEWS

TOOTH FORM DRAWING AND CARVING.

By RUSSELL C. WHEELER, D.D.S., F.A.C.D.,
Late Associate Professor of Anatomy,
Washington University School of Dentistry.
Second edition. $10\frac{3}{4} \times 7\frac{3}{4}$ in. Pp. 106 + x,
with 124 illustrations. Spiral binding. 1954.
Philadelphia and London: W. B. Saunders
Co., Ltd. 22s. 6d.

A SEARCHING and painstaking study of tooth form lies behind the production of this book and the author has succeeded in formulating detailed stage-by-stage instructions which should enable anyone to produce drawings and carvings of high standard. But here perhaps the author's objective is open to criticism rather than the way in which he has fulfilled this aim. It is questionable whether there is a place for a text full of instructions which, excellent though they are for their purpose of achieving the end-result, are almost entirely mechanistic in nature and do not serve to foster an understanding of tooth morphology in relation to development, comparative anatomy, or function. Surely it would have been of value to have included a word on the function of marginal ridges when their position and geometric form is described. On the other hand it is lamented that so much stress is laid on the subdivision of each tooth surface into nine areas, since this is only an arbitrary arrangement which bears no relation to function and is only necessary for descriptive purposes.

The book is profusely illustrated by photographs and line drawings of a high standard, but unfortunately many do not appear to serve any useful purpose or labour a point to the extent of irritation. Does a photograph of the previous edition surrounded by large-scale tooth carvings form a suitable frontispiece for a scientific text? Finally we cannot believe that metric graph-paper is such a rare commodity in the United States that it is necessary to give the supplier's name, address, and catalogue number.

The great deal of care and effort which have gone into the writing of this book will be

appreciated by those wishing to produce perfect drawings and models of teeth. J. A. P.

AN ATLAS OF DENTAL HISTOLOGY.

By E. B. MANLEY, M.Sc., B.D.S., F.D.S. R.C.S. (Eng.), Professor of Dental Pathology, University of Birmingham; E. B. BRAIN, B.Sc., F.I.B.P., F.R.P.S., Lecturer in Dental Histology, University of Birmingham; and E. A. MARSLAND, Ph.D., B.D.S., L.D.S. R.C.S. (Eng.), Lecturer in Dental Pathology, University of Birmingham. Second Edition. $9\frac{3}{4} \times 7\frac{1}{4}$ in. Pp. 91 + viii, with 157 illustrations. 1955. Oxford: Blackwell Scientific Publications. 21s.

THE reputation of Professor Manley in the field of dental histology is such that a second edition of this book must command attention. Considerable changes have been made which have further improved a book that has always been a notable success since its first publication. The enlarged text makes the photomicrographs easier to follow, but at times the author seems to be too intent on being too concise and brief. Admittedly this is an atlas of dental histology and must be used in conjunction with standard text-books and deals only with fundamental aspects. However, the work has been so brilliantly conceived and executed, that it should be possible to extend this into a text-book of high authority, while at the same time keeping the same format.

It carries a wealth of information not only for the student but for the teacher and post-graduate. The section on histological preparation is essential in a book of this kind and has been dealt with faithfully and in keeping with the general idea of an atlas of this description.

The only photograph to which possible exception may be made is Plate 49 which does not come up to the unusually high standard of the others.

The authors are to be congratulated on a book that not only fills a real need in dentistry, but expresses its facts and presents its illustrations in such a fluent and illuminating style.

The book's low price will ensure that it will be in the hands of every student. N. L. W.